

CQ-TV

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No. 128

BRITISH AMATEUR TELEVISION CLUB

NOVEMBER 1984

SLOW-SCAN WIZARDRY



THIS FIRST OF A NEW TWO-PART
SERIES EXAMINES THE LATEST
DEVELOPMENTS AND TECHNIQUES OF SLOW-SCAN TELEVISION

also.....

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FULL YEAR: £4 or £1 for each remaining quarter of the year. All subscriptions
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OVERSEAS MEMBERS are asked to send cheques bearing the name of the bankers
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The committee would like to wish everyone a happy Christmas and a fruitful new year.

CLOSE FOR PRESS DATE FOR THE FEBRUARY ISSUE.....20th December 1984



EDITORS POSTBAG

Dear Ed,

I first heard of the BATC through my association with the G-QRP club. I have in the past obtained copies of BATC handbook-1 and TV for Amateurs through the kindness of QRP club members. As I am building an ATV station I would like to subscribe to the BATC in order to benefit from the PCB's and other components available to members. In New Zealand the main activity is in Wellington where there is an ATV repeater using 443MHz input and 610MHz out. We don't yet have UHF TV so 610MHz is available to amateurs by special agreement with the NZ post office. We use 625-line PAL with 5.5MHz sound as there is plenty of room in our 70cm band (430 - 449.75MHz). There is only one station on the air in Auckland but 3 others and myself are under construction. Any advice would be appreciated as we are all newcomers to ATV. I have seen the excellent tape that was sent from VK to G and back, it was most enlightening.

M.Sheffield ZL1ABS

Dear Ed,

I received my copy of the "Amateur TV Introduction Booklet" today. Congratulations on a very well produced publication. The page on slow scan was just right - a pity there wasn't a similar page on NBTv. This wasn't even mentioned in the list of "abbreviations"! Why not? There has been an NBTv demonstration at every BATC show since 1984!! - slightly better than the slow scan record. This isn't a swipe at SSTV - good luck to them. Indeed, take away that slow scan page and what is left? A newcomer (and this IS an

"introductory" booklet) would imagine that the commercial box of tricks was the last word in TV and all amateurs have to do is build it and/or operate it.

The first ten years of BATC showed a high level of experimentation with little reverence for the commercial article. Over the next fifteen years, a certain amount of "orthodoxy" began to creep into the literature. Slow scan from about 1963 and NBTv from about 1975 introduced a bit of new thinking, but that's about all the innovation that's noticeable. I get the feeling that if anyone started some brand-new TV technology tomorrow, they'd be positively frowned upon for rocking the 625 line, 50 cycle, PAL boat!

That diagram on page three is, I'm sure, the last thing a newcomer would want to see - it's terrifying!

You and I know what it means (I hope) but a novice might get the idea that this is REAL TV and anything less.....isn't.

Incidentally, isn't it the convention that increased modulation points UP the page? If modulation is negative, (recommended on page four) surely the sync pulses should stick up in the air?

Print this moan if you're short of copy for the next issue.

Doug Pitt.
Chairman, NBTVA

Dear Ed,

First let me say how much I enjoyed issue No.127, (I enjoy all issues, but 127 was really something!).

The new series "In The Studio" by John Goode is excellent, giving all the important technical information in a very easily understood manner. I hope John can continue with this series and perhaps include a chapter on the relationship between "Pixels" and scanning systems. I've tried to co-relate various monitor specifications showing lines, B/W rise-time and picture fcy, but have only become more confused!

Regarding the fcy drift versus temperature problem with the NE564 PLL, I can confirm similar trouble when using these in a SECAM coder, so much so that in the end I had to scrap it.

Congratulations for the effort you and the committee put into the club.

Bill Mercer
Athens, Greece.

NEWS ROUNDUP

BATC PROJECTS UPDATE

G8KZG has sent in a couple of notes about projects from past BATC publications:

PROJECT 100 SPG.

The first concerns the Sync Pulse Generator design in CQ-TV100, for which PCBs are still available.

If the unit is constructed using 'LS' TTL devices then IC7 should remain as a normal 74 series. All the other ICs for which an LS version is available can be changed. This reduces the current drawn by the board to around 180mA.

If this modification is done however the capacitors from IC23 pins 3 and 9 should be changed to 0.01, also the resistor from pin 9 should be made around 12k.

MIX EFFECTS AMPLIFIER HB2

The Mix Effects Amplifier described on page 38 of BATC Handbook-2 suffers from a residual band of "wrong" picture down the left hand side.

The cure for this is to move the diode at the blanking input from the base of the BC183 and connect it from the junction of its associated 0.1 and 10k resistor to ground. The circuit may be found on page 43.

4.5" IMAGE ORTHICONS

Members Services have available some 4.5" Image Orthicon camera tubes at £10 each.

Anyone interested should contact Peter Delaney to arrange transport or collection.

OVERSEAS MAILING

Overseas members are reminded that, when sending money to the BATC, including membership renewals, payment should be made either by a cheque bearing the name of the banks' London agent or by International Money Order. Please do not send foreign cheques.

Unless otherwise arranged, CQ-TV magazines are sent by surface mail. Should you wish to have your copy sent by Air, this can be arranged by including sufficient extra payment with your subscription renewal to cover the extra postage.

The extra charges are:-

Europe	£1.50 per year
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When requesting airmail please make your instruction clear on the renewal form.

All subscriptions should be sent to:-

BATC, "Grenehurst", Pinewood Road, High Wycombe, Bucks HP12 4DD, England.

CHANGE AT FORTOP

Due to personal circumstances Steve Whalley G4DVN has left Fortop Ltd. This means that Steve Mitchell GBJMJ is to continue, for the present, by himself. Because of this, correspondence should not now be sent to the usual Werrington address but instead should be directed to: 9 Rybrook Grove, Turnhurst Farm Estate, Chell, Stoke-on-Trent ST6 6PX. Tel: 0782 825148

Fortop have accumulated a quantity of rather specialised components - mainly UHF and microwave in nature - which most of us find hard to get. If you would like a list of the items available, please send a SAE to the above address. You may be surprised!

GB3UT AND GB3UD ON THE AIR

Although I have not been informed officially, I understand that the Bath ATV repeater went on the air at the end of August.

The channel used is RMT-1, (1276.5MHz vision input and 1311.5MHz vision output).

As far as I know AM is being transmitted by the machine but I'm not sure about the input requirements.

Hope to have more details in the next issue.

I also understand that the Stoke-on-Trent repeater GB3UD is due to go on the air at any moment. Using RMT-2 (1249.0 in, 1318.5MHz out) the repeater will be in 24-hour beacon mode at first until the repeat equipment's trials have been completed.

CIRCULAR POLARISATION FOR THE BEEB

With all this recent talk of helical aerials and circular polarisation, I was interested to learn that the BBC have decided to go circular on all their VHF radio broadcasts.

It seems that circular polarisation

is now favoured because it gives equal quality of reception to both vertical and horizontal aerials. They all come round to it in the end!!!

SUBSCRIPTIONS

ALL members are reminded that subscriptions fall due on the first of January 1985. Please don't ignore the reminder elsewhere in this issue!

You should have received a renewal form with this issue, (unless you have already paid). Before the dog gets it or the kids make a paper dart from it, please fill it in and send (with your £4) today. You won't lose anything by paying early! If anyone has not had a form, we're sorry. Please jot your name, address and call sign on a piece of paper saying what the money is for and send it to:

BATC, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD.

How about enrolling a friend as a Christmas present?

BANK TRANSFERS

Please note that bank standing orders and Giro transfers are not acceptable as payment by the BATC. Despite the fact that this has been the practice for a number of years, the Treasurer informs me that the following were received last year: 4 Bank orders @ £4, 1 @ £3, 11 @ £2, 3 @ £1 and 2 @ .50p! Also there were 3 Giro transfers.

You can see from this why the systems are not appropriate for subscriptions therefore, if you think you still have a running order with your bank, please cancel it straight away. Now that membership is handled by computer, failure to do so will probably result in your not receiving CQ-TV. Now you wouldn't want that, would you?

SSTV ON THE SPECTRUM

Scarab Systems have just announced a new software package which allows you to receive and display SSTV pictures on your monitor screen WITHOUT THE USE OF ADDITIONAL HARDWARE.

The receiver's audio signal is fed directly to the Spectrum via its EAR socket and the micro will then display the picture on the screen. Features include up/down scrolling, adjustable grey scale and sync, save picture to tape, input analysis routine and recall last picture from memory.

Priced at just £15 inclusive this package could be a great boost for SSTV.

Scarab Systems, 39 Stafford Street, Gillingham, Kent. Tel: Medway (0634) 570441

"SSTV SCENE" STOPPED

You may have noticed that the "SSTV Scene" column has not been appearing in 'Radio Communication' of late. The RSGB Technical and Publications Committee apparently consider that there is insufficient interest to warrant its resurrection, and therefore items of SSTV news will now be accommodated in either "The Month on the Air" or "4-2-70" columns.

CQ-TV magazine would like to run a regular column devoted to the subject so, if anyone is interested in conducting such a column, perhaps they would contact me (Editor).

NEW SSTV PC BOARDS

Following the article by Peter Asquith G4ENA "Modifications to the G3WCY SSTV Scan-Converter" which appeared in CQ-TV 127, BATC Members Services now have a set of four printed circuit boards available which includes: Frequency to Voltage Converter, Width and Line board and two memory boards. The price is £5 per set plus 30p postage. It is regretted that sets can not be split. Please order on the Members Services form in this issue.

MIXED BATC ORDERS

It seems that a number of members are still sending orders for Members Services items and Publications either to the wrong address or mixed orders to one address.

This creates much extra work (and expense) not to mention delay to the customer. Would you PLEASE make sure that Members Services and Publication items are ordered separately and FROM THE APPROPRIATE ADDRESSES.

CAMERA FOR THE BBC MICRO

'The Micro-Robotics EV1 is a revolutionary new electronic camera that can be connected to your computer to give it the power of sight'.

Similar in effect to a 'Frame Freeze' video camera, this unit produces black and white images directly onto the VDU screen. The camera itself is small, measuring only 70 x 50 x 55mm and is similar in appearance to a small still camera.

Complete with a 1:2.8 18mm Asahi Pentax-110 lens and a comprehensive software package, this unit could find many applications in ATV as well as numerous other fields.

Price £131.20 inclusive (software on disc (40 or 80 track) £2.00 extra). Commotion, 241 Green Street, Enfield, EN3 7SJ. Tel: 01 804 1378

24cm MOONBOUNCE

A report in the last issue spoke of an attempt to reflect ATV pictures off of the moon using a huge aerial. Unfortunately the attempt had to be called off due to some problems with the computer control system. It is hoped now to try again sometime in October.

24cm ATV REPEATER(S) FOR SOUTHAMPTON
/BOURNEMOUTH AREA

A number of people have expressed interest in a 24cm TV repeater for the Southampton/Bournemouth area. Several possible locations are being discussed. Suggestions have been made that it may be better to have two repeaters - one for the Poole/Bournemouth area, and one for the Southampton area. This would permit better coverage of the low lying areas in the central parts of Southampton, Bournemouth and Poole. In order that any proposals can take into account all interested amateurs in the areas concerned, it would be most helpful if those genuinely interested could contact Nick Foot G4WHO at 47 Mallard Road, Colehill, Wimborne, Dorset.

SOFTWARE MAGAZINE COPY

I am able to accept copy for CQ-TV magazine on either 40-track disc or tape suitable for the BBC computer. The material should preferably be compiled using Wordwise or View word processors, however for those without these facilities a straight ASCII dump can also be used. Please do not embed text in a BASIC program, it only means a lot of editing to get rid of all the line numbers and commands etc. Please ALWAYS keep a backup copy of any material sent.



SOME NOTES ON SSTV

By C Grant Dixon G8CGK

I have been actively engaged in SSTV since 1959, the year in which the first description of the system appeared in "QST" magazine, and as there is an upsurge of interest amongst the newcomers to our hobby, I thought it would be a good idea to write down a few random jottings which could serve as background information and possibly food for thought.

HISTORICAL

First of all, it is not generally realised that the SSTV system originally devised by Copthorne Macdonald was an AM system with negative going video modulating a 2300Hz sub-carrier. After a couple of years trial with this system it soon became obvious that an FM system would give superior results, particularly from the point of view of ignition interference which, with the old AM system, gave rise to spurious sync pulses. Hence we now have our present FM system with 1200Hz for sync, 1500Hz for black and 2300Hz for white. How nice it would have been if the white frequency had been 2400Hz; so much easier for pattern generation, but this is a piece of history we have inherited. Another historical relic is the 1:1 aspect ratio of the picture; this was chosen so as to make best use of the circular 5FP7 radar type CRTs which had an afterglow screen and was used in the early monitors. These tubes gave good pictures, especially when viewed in the dark, but there was always the annoying fading of the trace and the brilliant refresh line coming down the screen. Modern scan-converters which use computer-style memories to display the SSTV picture on a standard fast-scan monitor screen have to fit the 1:1 picture into the 4:3 and 312-line picture (assuming no interlace). As the SSTV picture is usually 128 lines, this is done by displaying each line twice and thus using 256 of the 312 lines available; in addition a blank space is inserted at the start and end of each line as shown in Fig.1.

The earlier SSTV experiments were all done with 120 lines, but with the advent of logic ICs for counters it became obvious that 128 lines would fit into a binary counting system much better. A few designs used the difference between 120 and 128 lines to put in an 8-line section of grey scale to permit easier adjustment of the monitor.

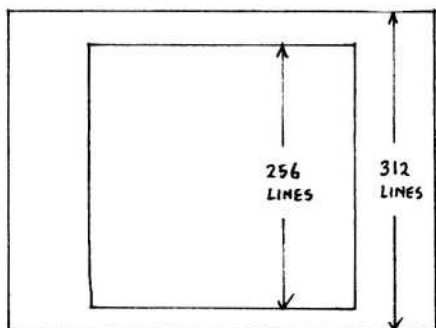


Fig.1

Deriving the SSTV format.

Many newcomers do not realise that there are actually TWO standards for SSTV. In the USA the mains frequency is 60Hz and this is divided by 4 to give a line frequency of 15Hz; in the UK we use 50Hz divided by 3 to give 16.666Hz. The respective periods are 66.66ms and 60ms. Thus with a frame of 128 lines the vertical read-out time is 8.53s in the USA and 7.68s in the UK. As the lines of an American picture are longer, the use of a width control will bring them down to the correct size; similarly, our pictures look narrow to the American SSTV viewer and he has to adjust his width control in the opposite direction.

When Cop Macdonald first devised the SSTV system, his aim was to send a reasonable picture within the audio bandwidth of a normal sound transmission - say 300Hz to 3000Hz - and the 120-line picture (or 128-line) does a good job in this respect. Of course, he could have chosen standards to give twice the definition in each direction, but the transmission of a single picture would have taken four times as long - about half a minute - and it was judged that the immediacy of 7s or 8s picture was a good compromise. After all, if you want really good definition you can use FAX, and if you want movement you can increase the bandwidth and use fast-scan TV.

RESOLUTION

Let us look into the question of resolution of an SSTV picture. At any given period of time during the picture, the frequency determines the level of grey. Thus the period of 0.5 of a cycle is the smallest 'information packet' which is being transmitted, and one can only make use of this half-cycle if the waveform is symmetrical about the axis as can be seen in Fig.2. When the waveform is asymmetric with respect to the axis then the two periods between the crossing points are different and would be interpreted as two different shades of grey.

Now for a black signal:- $f=1500\text{Hz}$ $t=666\mu\text{s}$ $1/2t=333\mu\text{s}$
Line time=60ms...less 5ms for sync gives 55ms
Hence the possible elements per line = $55000/333 = 165$

For a white signal:- $f=2300\text{Hz}$ $t=434\mu\text{s}$ $1/2t=217\mu\text{s}$
Hence possible white elements per line = $55000/217 = 253$
Average no. of elements per line is 209.

From this we can see that the usual 128x128 pixel scan converter is not using the full potential of the system. In fact my own experiments have indicated that a 5FP7 monitor is capable of better resolution than a digital system providing that the CRT has a sufficiently small spot size on the screen. I wonder if anyone would like to design a scan converter with a 128x256 memory which would give better resolution in the horizontal direction.

SYNC PULSES

There are two different ways of adding sync pulses to the SSTV video as shown in Figs 3&4. In fig.3 the frame sync pulse, which is of 30ms duration, starts at the end of the last picture line and continues until the start of the first line of the next picture. As a result of this, if the line oscillator is free-running, at the start of the picture the sync pulse is half the line period out of step with the oscillator and a 'hard lock' circuit is needed to bring it rapidly back into step. In Fig.4 the frame pulse occurs during the first line and the rhythm of the line sync pulses is not interrupted. I would strongly advise the adoption of this latter method even though it means the loss of the first half of the first picture line. A small price to pay for a more elegant system.

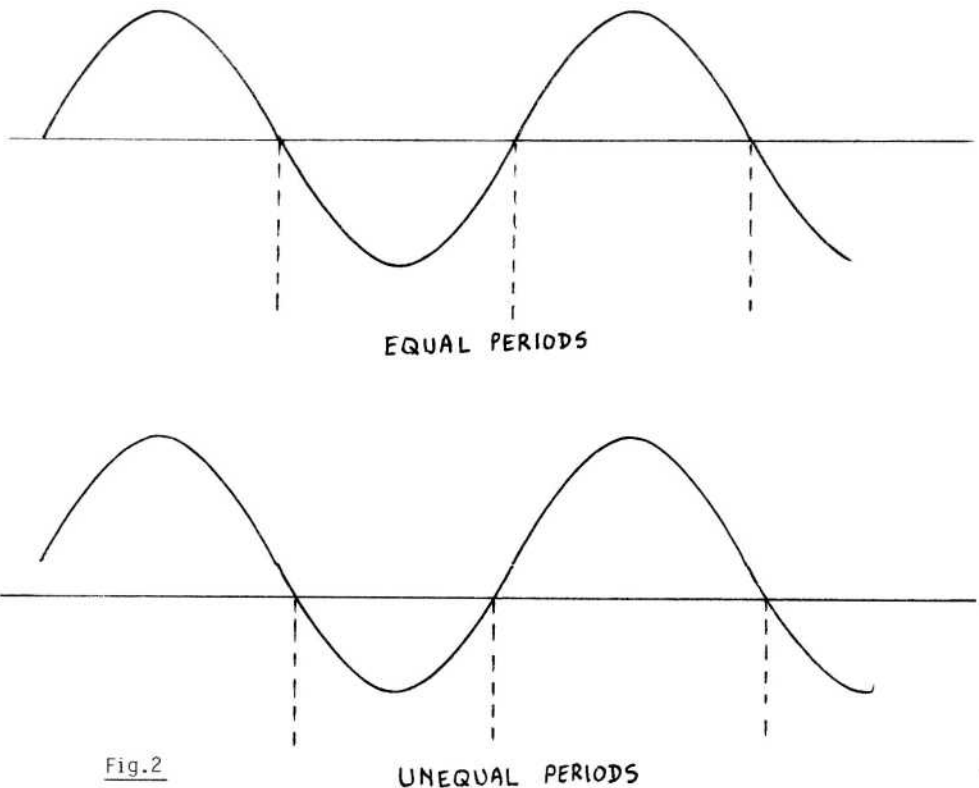


Fig.2

SCAN-CONVERSION....Fast to Slow.

The first scan-converters used in SSTV were designed to allow a normal TV camera to be used for generating the SSTV signal. For this purpose there were two approaches, the line-sampling camera and the line-store converter. In the former a normal TV camera was modified so that its frame timebase was scanning at the SSTV line rate ($50/3\text{Hz}$) and the camera was put on its side so that the picture was scanned vertically with 3×312 lines. The grey value was sampled, using an electronic switch, for a brief period on each line and this series of samples constituted one SSTV line. The process was then repeated at intervals down the picture thus producing the required 128 SSTV lines. The great disadvantages of this method were the need to modify a camera and the difficulty of monitoring a fast-scan picture.

The second form of scan-converter cleared up these problems. In the line-store converter a single line of a fast-scan picture is digitised and clocked into a quadruple shift-register during the $60\mu\text{s}$ of the line. During the next THREE fast-scan frames (60ms) this data is clocked out of the shift register at the slow rate thus generating the SSTV signal. The digitising process can be done with a string of 711 dual comparator ICs as shown in CQ-TV 118 p31. These are fairly cheap devices and this circuit will therefore appeal to the amateur constructor. Recently some 'flash digitiser' ICs have appeared on the market which will digitise to 64 levels (6 bits) at a rate of

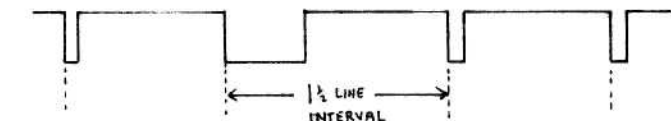


Fig.3

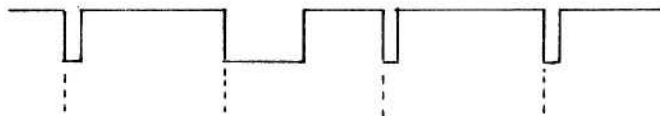


Fig.4

EQUAL INTERVALS

15MHz, but the price is as astronomic as the performance. The string of 711s will digitise to 16 levels (4 bits) and this is quite adequate for most amateur requirements. The limitations of 16 levels only become apparent when there are large areas of the picture with only slight changes in the grey level and the phenomenon of 'contouring' is observed. Contouring is less apparent where a picture has a lot of detail and there are rapid transitions through several grey levels, or where the number of grey levels is much larger - 64 for example.

The mention of 'quadruple shift-registers' above, ties in with the 4 bits which the 711s produce; one shift-register is allocated to each bit. If the fast clock is made a little too fast then the first part of the fast scan line disappears out of the end of the shift-register and is lost. This is a good thing as it enables us to adjust the left-hand edge of the SSTV picture with relation to the fast-scan screen. See Fig.1 again. Similarly, if the slow clock is too slow it fails to deliver the last bit of the line and this can be used to control the right-hand edge of the SSTV display. But shift-registers are now going out of fashion as a means of storage and they are being replaced by the more versatile RAMs (Random Access Memories) which are limited only by their access time. If they are used in a manner similar to the shift-register then they should be capable of being clocked at about 5MHz, which means that the access time should be less than 200ns. Dynamic RAMs are readily available with access times of 150ns and these serve as very satisfactory picture stores. The main difficulty with RAMs is that each chip requires a large number of address lines and it is these addresses which must be clocked at the fast or slow rate; on the bonus side, however, is the fact that each picture element can be selected by using the correct address and one is not limited in the order in which they are selected.

SCAN-CONVERSION....Slow to Fast.

When we come to consider the use of a fast-scan monitor to display SSTV it is easily seen that the required memory must be large enough to store a complete picture as the fast-scan display must repeat its display many times in the course of a single SSTV frame. In computer terms we need $128 \times 128 \times 4 = 64k$ bits or 8k bytes. As there are 8 bits in one byte, we can store two 4-bit pixels in each byte. Memory chips are being made with ever increasing capacity and this amount of memory could be built using four 4116s (16k by 1 bit) or even a single 4416 which is conveniently 16k by 4 bits. Note that although dynamic RAMs usually require refreshing, if we are using them in a

rapid read-out cyclical manner the refreshing will occur automatically and there is no need to make special provision for it.

One of the earliest slow-to-fast converters, which was designed by WB9LVI, used four massive recirculating shift-registers with some clever circuitry involving a line buffer store which was switched into the path of the recirculating data to give a 'load-on-the-fly' arrangement. The advantage of having RAMs for memory is that one can load a complete picture into memory in the fast-scan frame time of 20ms, which is within the SSTV frame sync pulse. Thus we can display successive frames of SSTV, taken as snapshots about 7.68seconds apart. With the use of a line store the subject must remain still in front of the camera for the full 7.68 seconds - as for a Victorian photograph!

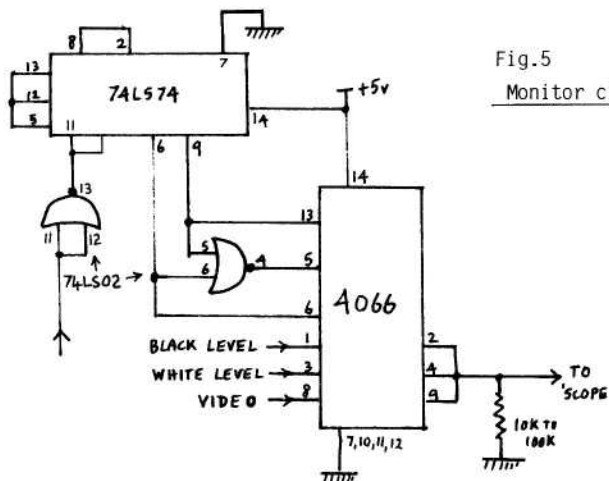


Fig.5
Monitor circuit

QUALITY CONTROL

When a fast-scan signal is digitised it is essential that some form of monitoring is used to check that all 16 grey levels are being used in the conversion. Fig.5 shows a circuit which can easily be added to a converter which uses a chain of 711s. The output of this circuit is fed to an oscilloscope which has its timebase set to display 3 fast-scan frames. The fast-scan line sync clocks a divide-by-3 circuit which closes three electronic switches in rapid succession. Thus, on the screen of the CRO we see a sequence of 1 line of white level, 1 line of black level and 1 line of video, which is repeated across the screen. This gives the appearance of a steady line at the white level, a similar line at the black level, and the varying video signal in between. The white and black level controls are then adjusted so that the video waveform lies between them. If the white level is too low or the black level too high, then clipping will occur and this can be seen on the SSTV display as large areas of white, or black, with very little detail in them. Note that some digitisers use 'contrast' and 'brightness' controls rather than the white and black level controls referred to; the principle of setting the video between the two levels remains the same.

Whilst on the subject of picture quality, it is worth doing some trials with a series of different pictures as it appears that some pictures are more suitable than others for the SSTV system. Experiment with a critical eye on the SSTV screen and you will soon find out the type of picture the SSTV system likes best.

To be concluded in the next issue.



Subscriptions are due on January 1st 1985. A renewal form will be included with this issue unless you have already paid. Please enclose £4* with the completed form to: BATC subs, 'Grenehurst', Pinewood Road, High Wycombe, HP12 4DD, England. Cheques and Postal Orders should be made payable to 'B.A.T.C.' Overseas members are asked to pay by International Money Order or by a cheque bearing the name of the banker's London agent.

*Overseas members wishing to have their magazine sent by air mail should add the appropriate amount as detailed in the 'News Roundup' column of this issue.

STANDING ORDERS AND GIRO TRANSFERS

The Treasurer regrets that no method of bank transfer or orders can be accepted by the club. Although this practice has been discontinued for a number of years, there are several members whose standing orders (usually VERY out of date) are still being received each year.

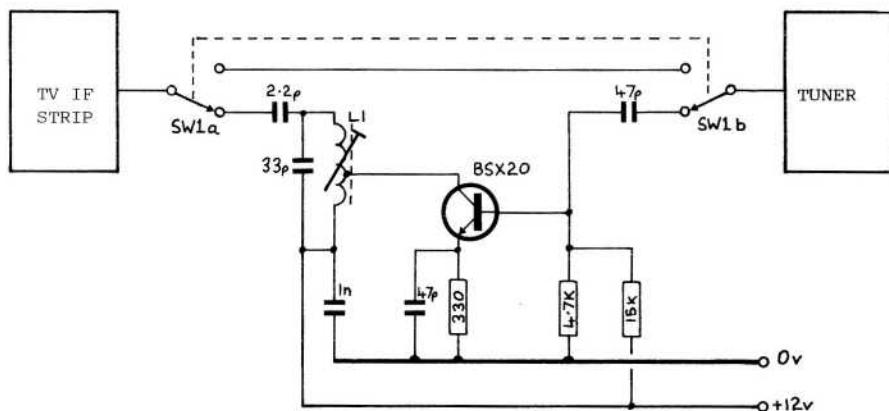
Members who used to pay by this method are asked to check with their bank to ensure that orders are not still being paid. If they are then please cancel immediately.

NARROW-BAND IF FILTER

By MIKE SANDERS, 68LES

If you have ever used a narrow-band filter in a TV receiver you will know how it can improve a picture subjectively; by cutting bandwidth down to 1 MHz or so the signal-to-noise ratio on the screen can be improved dramatically. Pictures seem to rise out of the noise and you may well be prepared to trade resolution you would not have seen in the noise for a cleaner picture.

This little circuit installed in your shack receiver will do just that. Tune the coil for maximum noise with no signal and be prepared to do a bit of twiddling to get best results.



- L1. 16t 26swg enamelled copper close wound on 4mm former.
Ferrite core, tap about 4t from cold end.

Fig.1

NARROW BAND IF FILTER

A VISIT TO ADELAIDE

By Ian Waters G8ADE

One reason why G8ADE is not found more often on the bands is that my job demands a fair bit of travelling. Prior to a recent visit to VK I gathered together one or two addresses of ATV'ers in the area in which I was to visit.

I arranged to visit John Ingham VK5KG a leading Australian ATV'er. I knew of course from previous references in CQ-TV that ATV technology is well advanced in Australia, nevertheless the demonstration which John provided at zero notice was most impressive.



VK5KG IN HIS SHACK

As it happened the Adelaide repeater VK5RTV was temporarily out of action for maintenance on the day of my visit, so John turned his beam North and put a call out in the direction of another repeater - VK5RCN - located at Snowtown some 100km distant.

Fortunately there was a slight lift and we were immediately rewarded with a colour picture and sound relayed from VK5AWS in Port Pirie a further 100km to the North.



The transmission from VK5AWS was to system 'B' PAL standards with 50W peak sync vision on 426.25MHz and sound on 431.75MHz into a home-made 12 element aerial.

The Snowtown repeater which is wind generator powered, radiates vision and sound on 444.25 and 449.75MHz respectively via a horizontally polarised omni-directional aerial. It inserts digital information into the top of the relayed picture to indicate time and battery voltage.



A command tone may be sent to switch the output to locally generated colour bars so that the quality of the path from repeater to station may be determined. Command tones are also used to switch between omni-directional and rotatable beam receiving aerials and, when the beam is selected, to enable it to be rotated, the strength of the signal is indicated by a bar which appears across the bottom of the picture.

Although the Adelaide repeater was not operational, I was able to see a video tape describing

its facilities. These include a scan converter enabling it to convert fast to slow scan and vice versa. Its output is horizontally polarised and on a rather higher frequency with vision and sound at 579.25 and 584.75MHz respectively. The large frequency separation permits the two repeaters to be cross-linked.

Until recently all primary broadcast TV in Australia has been on VHF (including band II), with UHF only used for some low power transposers. With the advent of new high power UHF services frequency allocations are under review. It is hoped that the special Australian ATV frequencies will remain available to amateurs.

By mid-evening quite a number of ATV stations come on the air. Pictures, all in colour, were to be seen from VK5AWA, VK5KMR and VK5GG who is President of the Adelaide ATV group which designs, builds and maintains all the repeater equipment.

To round off the evening John ran some more video tapes, one showing 30-line pictures received from Melbourne on 160 metres and another showing some excellent black and white pictures received on 70cm from a camera and transmitter carried in a large fixed-wing model aircraft. It appears that the aviator would like to try colour but no one seemed over keen to lend him their colour camera!

My thanks to John and the other VKs for a very interesting evening.



CHARACTER GENERATOR KEYBOARD

By Trevor Brown G8CJS

There have been several methods of operating the original character generator board, which appeared in Handbook-1, from a keyboard rather than the diode matrix originally provided or from the memory extension board also featured in the same publication.

This article shows how the popular ASCII keyboard produced by Maplin Electronic Supplies Ltd., can be used with this system.

Table 1 details connections from the Maplin keyboard to the character generator board, whilst Fig.1 illustrates the original PC board fitted with the piggy-back memory board described in Handbook-2 and showing the necessary connections for the keyboard.

To aid in understanding this system the circuit of the keyboard is also shown. Keyboards are available from Maplin Electronic Supplies Ltd., P.O.Box 3, Rayleigh, Essex SS6 8LR.

Any queries regarding this project may be directed to me on 0532 670115 or by sending a SAE to 25 Gainsbro Drive, Adel, Leeds LS16 7PF.

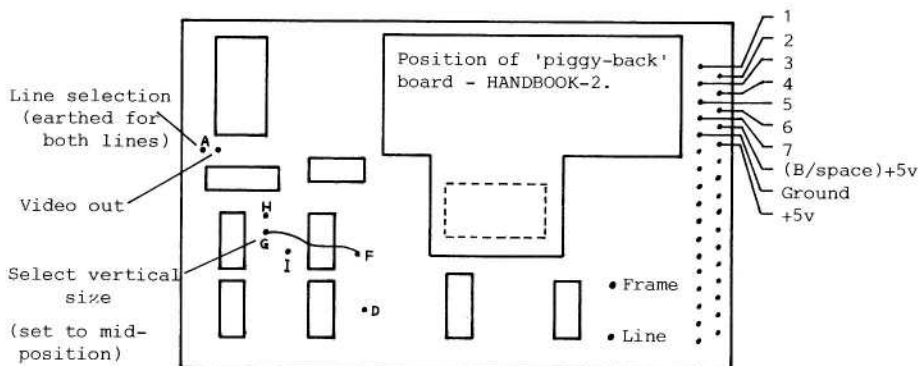
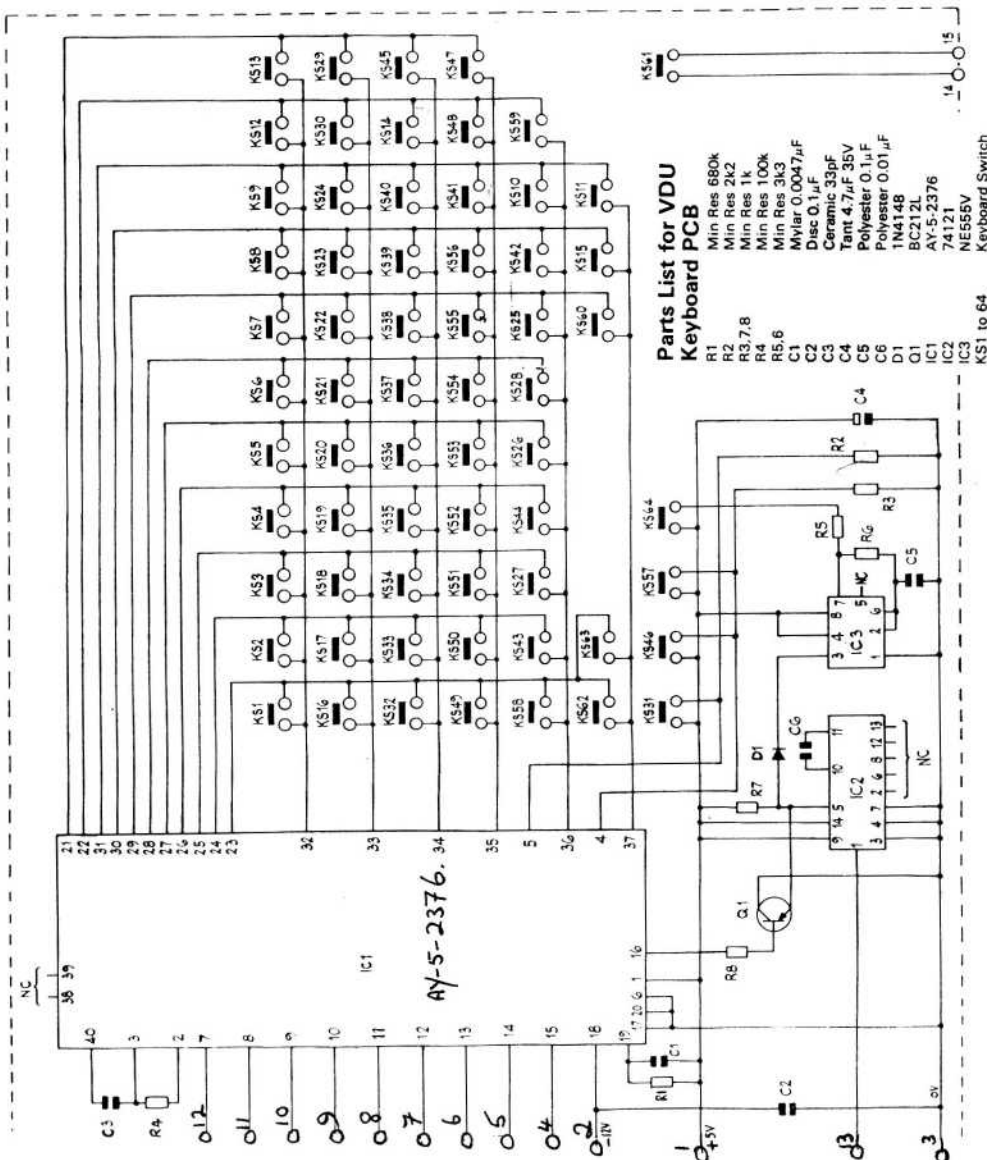


Fig.1

CHARACTER GENERATOR BOARD - PIN CONNECTIONS



KEYCODE -

KS1 = 1	KS13 = S
KS2 = 2	KS14 = P
KS3 = 3	KS15 = G
KS4 = 4	KS16 = H
KS5 = 5	KS17 = K
KS6 = 6	KS18 = L
KS7 = 7	KS19 = ;
KS8 = 8	KS20 = ' "
KS9 = 9	KS21 = ~
KS10 = 0	KS22 = N
KS11 = -	KS23 = U
KS12 = =	KS24 = I
KS13 = <	KS25 = O
KS14 = >	KS26 = P
KS15 = ?	KS27 = [
KS16 = {	KS28 = \
KS17 = W	KS29 = +
KS18 = E	KS30 = PAGE
KS19 = R	KS31 = SPACE
KS20 = T	KS32 = REPEAT
KS21 = Y	
KS22 = M	
KS23 = <	
KS24 = O	
KS25 = P	
KS26 = [
KS27 = \	
KS28 = +	
KS29 = PAGE	
KS30 = SPACE	
KS31 = REPEAT	
KS32 = A	

Also required

61	Keypoint 1-position
1	Keypoint 2-position
1	ASCII transparency
1	DIL Socket 8-pin
1	DIL Socket 14-pin
1	DIL Socket 40-pin
1	VDU Keyboard PCB
73	Pins 2141

Parts List for VDU Keyboard PCB

R1	Min Res 680K
R2	Min Res 2k2
R3,7,8	Min Res 1k
R4	Min Res 100K
R5,6	Min Res 3k3
C1	Mylar 0.0047μF
C2	Disc 0.1μF
C3	Ceramic 33pF
C4	Tant 4.7μF 35V
C5	Polyester 0.1μF
C6	Polyester 0.01μF
D1	TN4148
Q1	AY-5-2376
IC1	74121
IC2	NE555V
IC3	Keyboard Switch
KS1 to 64	

TABLE 1			
GEN BOARD PIN NO's	MAPLIN PCB PIN NO's	I/C AY5-2376 KBRD ENCODER PIN NO's	AY5-2376 FUNCTION
1	9	10	DATA OUTPUT B6
2	8	11	DATA OUTPUT B5
3	7	12	DATA OUTPUT B4
4	6	13	DATA OUTPUT B3
5	5	14	DATA OUTPUT B2
6	4	15	DATA OUTPUT B1
7	13	16	STROBE VIA TRANSISTOR & IC

CONNECTIONS FROM MAPLIN ASCII KEYBOARD TO
'HANDBOOK-1' CHARACTER GENERATOR BOARD.

ATV AT 'HAMFEST-84'

Organised by the Flight Refuelling Radio Society and the Bournemouth and District R.A.I.B.C., this year's Hamfest'84 on August 19th, near Wimborne, Dorset, attracted radio amateurs and their families from a large part of Southern England. Unlike many rallies, Hamfest'84 had many attractions for the whole family, with model train rides and other amusements for the children and a craft fair, lectures and demonstrations for wives and girl friends.

Amongst the usual attractions for the radio amateur, Mark Bloor G6JIX and Tony Marsden G6JAT brought their ex-BBC OB vehicle along, which they are currently renovating. Mark and Tony have spent most of the last 9-months getting the vehicle on the road and installing an impressive array of ex-broadcast television equipment. The rally was the first outing since the installation of equipment, and although the exterior remains to be fully renovated, the enormous amount of work already done on the interior was apparent to all who ventured inside.

Considerable interest was generated by the demonstration of a working Marconi Mk VII colour camera manned by Brian and Paul. The van's vision output fed a 24cm vision link, which consisted of a QRP transmitter, kindly loaned by Allan Latham G8CMQ, feeding a loop Yagi loaned by Nick Foot G4WHO. The pictures which were of excellent quality, were received by Allan Latham on his Solent Scientific stand in a nearby marquee using one of his receive converters. This was, for many of the visitors, their first experience of 24cm ATV on the air.

Judging by the number of BATC membership application forms snatched up by eager visitors, it looks as though interest in Amateur Television is definitely on the increase.

TV ON THE AIR

Andy Emmerson G8PTH

Here we are again, with another international contest behind us. I hope it went well for you if you entered - despite the mediocre weather there was cheerful activity to be heard - and seen of course. However, I won't poach in the Contest King's purlieu, only to say PLEASE don't leave your caption up when you are not working a station. Two well-sited stations who should have known better were being cursed by others for monopolising the channel ...

Dateline: 25th August 1984, location: the little village of Ratby in Leicestershire. It is mid-afternoon and I am at the shack/workshop of Chris Smith G8LMW (possibly more familiar to you rally goers as LMW Electronics - the people with the transverters and other microwavey bits and pieces). I was drooling over his completely home-made ring-of-six amplifier for 23cm (350 watts output!) and listening to the 23cm beacons. "Flat, isn't it?" said Chris. "We haven't had a decent lift this year." "About time, too" agreed I. And with that I gathered up my bits and pieces and prepared to set off home. Now read on ...



Well, it was quite an opening, sufficient to affect broadcast TV reception on Band IV. Cyril (Silverstone Electronics) Hayward G4AHH rang up to say he had worked some interesting DX and was thinking of getting back on ATV. That was my prompt to get into the shack and some stations indeed were heard on the calling channel working TV. Operation was quite orderly too, partly because a lot of people did not seem to have realised there was a lift on. (Sore point with

some - the decent thing is to ring your mates. And I didn't!). The activity soon picked up and seemed to favour the east-west direction, with little heard north and south. Plenty of PA0 contactswere made, notably with PE1DWA (Hans in Zoetermeer) and PE1DWQ (Frits at Hommerts).

Grant Dixon G8CGK (Peterstow, Herefordshire) is probably known best as an SSTVer, but he has recently put together a fast-scan station as well. Using a few watts from a QQV03-20A transmitter he puts out a good signal, which reached G8GOQ/P out on the Mendip Hills, 40 miles away. Grant is also constructing for 24cm FM. In his letter Grant mentions two other active stations in his neck of the woods who swap pictures on 70 cm; these are Ray G6TSL in Ross-on-Wye and Peter G8WGD in Staunton. Soon to join them are John G1DIV (Cinderford) and Mike GW1EDP (Monmouth), also Mervyn who is an 'eyewig' at Upton Bishop and is studying for the RAE as a retirement project. Great - and good luck!

Someone else who went out portable recently was Andy Goy G4HJD from Hull, the place with the independent phone system. With Nick G8PSE he took a station equipped for 2M, 70cm and 24cm to Caistor, 16 km west of Grimsby. Sitting on a grass verge in the middle of nowhere they seemed to attract a lot of rain, but

despite this all the equipment seemed to work well. G3VZV has swiped the list of stations they worked, so I can't go into this but they seem to have had a good time despite the rain. With three ATV stations active in Hull they are looking for more contacts and are also building some BATC construction projects for 24cm FM. They travelled down to Leicester twice to work the repeater there but no success (I believe it is broken, lads) and will try the Dunstable one next. That's dedication!

Mike Cox (the G8HUA and committee member one) writes from his new QTH at Scholes, Cleckheaton in west Yorkshire to say that he is on the air again. All equipment is homebrew, starting with the CQ-TV 122 exciter into a two-stage G4DYP linear, but using BLX67 and BLX68 to get about 5 watts p.s.p.. A 2C39 linear is coming along. For receive Mike has a MM upconverter and a JVC CX-610 (these handy receiver/monitors do in fact tune 70cm - there is a preset pot for the varactor tuner inside, but then the tuning calibration is 'wrong'). Antenna is 21 element Tonna.

Highlight of the year (so far) for 'the poor unfortunates of west Scotland who have no sea path to the South or the Continent' was reception on 13th August of OZ1BCK running 1kW from Copenhagen! Although received at P5 strength, strenuous efforts by GM4BVU, CXM and UBJ failed to make contact in the other direction. Perhaps he was deafening his 2M receiver! But next time ...

Norrie's news service also reports on several mobile operations this summer. Gordon GM3ULP, David GM6BIG and Douglas GM4FKD assumed the Clyde Valley DX Group's call of GM4GM/P to go 2000ft up in the mountains near Peebles (this to try out the site for the International contest). P4 pix were exchanged with Norrie GM4BVU and P1 with Ray G4WVI in Whitley Bay. Some site and no linears either! Also out were two Keiths - GM8HGT in the Kilsyth Hills and GM1FAI in the Bathgate Hills. New receive stations are GM8YBP (Des, Lenzie), GM8BBA (Elvin, Bellshill) and GM1BLC (Alan, Kirkintilloch).



OZ1BCK - Copenhagen. Received on 70



Returning to the start of this piece, the reason I was at Chris's place was to have my 1296TT10 optimised at the bottom end of the band. The 1296TT10 is a solid-state 10-watt PA which Chris makes. Taking an input of 1 or 2 watts it produces 9 or 10, which means it is a very useful device for increasing the output from a Microwave Modules transverter or, say, one of the old Fortop TV transmitters. In my case I use it to drive an EME twin-tube PA, which needs a fair bit of drive. As

supplied the 1296TT10 is set up for 1296 MHz and has virtually no gain at 1250. However, Chris did the trick with his magic twiddling sticks, and I have no hesitation in recommending this device now. Note that LMW Electronics also carry a comprehensive range of transistors, microwave trimmers, chip capacitors etc. - if you are into this kind of construction you really ought to send off for his price list. The address is 102 Stamford Street, Ratby, Leics., LE6 0JU.

It was of course a bit of luck that I had my 24cm gear back in time for the lift - well it enabled me to make what I offer as the first TV QSO on 24cm between England and the Netherlands. The station concerned was PE1DWQ, Frits, while PE1HZR and PE1DWA were also on the band, though not seen here. There was a fair amount of fading and also diversity reception - PE1DWA was inaudible on two metres here, yet perfectly readable five miles away at G8UGU. All these Dutchmen were on Ancient Modulation, which meant I got out my trusty TVC1260/40 converter. Frits had to slope detect my signals.



G4HJD hard at it from the portable location.

I have been passed an interesting letter from Jan-Martin LA8AK. Apparently 70cm TV is not possible in Norway but 24cm is being examined. One amateur, LA4WN, is active on 24, and LA6LCA may be on the air later - they have already tried 3cm. Sound subcarrier was 7.5MHz but they are changing to 5.5MHz. How long will it take for us to follow suit, I wonder?

Allan G8CMQ rang up from his Solent QTH to pass on some activity news from his part of the world. There is now 24cm activity all the way along the coast from Bournemouth to Brighton. Slight lifts - better on 24 cm than on two metres - occurred on 16th and 19th August. On the Thursday John G6MPE (Brighton) got pictures to G4JQU in Southampton and G6XGH in Titchfield, using just 10 watts to a tripler.

Apparently John can work Chichester and Havant all the time. F1EDM (still temporarily receive-only) and F3LP were also worked. Three days later Allan managed to get a signal from Martin G8KOE. Newish stations on 24 include

G5NBX and G6CSX (Chichester) and G6RSV (Havant). There was also a 24cm TV walkabout demo at the Flight Refuelling Hamfest.

Activity in the Midlands is on the increase. There is a cluster of stations in the Greater Birmingham area, notably Geoff G3DFL, Arthur G5KS and Ernie G8MTF. (Arthur is now 73 and still constructing: he says 24cm is a far cry from playing with flying spot scanners in 1952!). George G4EUF at Markfield has got some of his station together and on the air with low power and G8BWC (Nottingham) is receiving signals.

Last word from Mike Cox G8HUA, who got a mention in the 70cm section. He says he has a Sandpiper 20-turn helix and is building the FM-IF strip from CQ-TV 122 ("good issue that one"). Anyone else on 24 FM, he asks. Well?

SSTV

I start the Slow-Scan section with an apology, to Richard G3WW. I accused SSTVers of having gone off the air for the last three months. Richard did indeed send in a report, and I am afraid this got lost in the PTH filing system (a pile of books and papers on the stairs waiting to go upstairs). Nonetheless, that was the only report received and apart from some more notes from Richard I have received no other slow-scan info at all.

That is exactly why there is so little SSTV info each time. It does make me chuckle to hear those SSTVers who always winge at the AGM that there is nothing for them in CQ-TV. Remember, you get out of CQ-TV exactly what you put in! If "TV on the Air" seems to major on 24 cm. each issue that is simply because microwavers send in more reports! Here we are then, the sum total of SSTV reports for the last three months.

The 7th of May was a red-letter day for G3WW as he made what is doubtless a world record - 2000 different two way SSTV QSOs. Congratulations Richard, this is no mean achievement, and I have not heard any challengers yet! Richard has been 'at it' since November 1972, and no doubt has added to this score in the meantime. The 2000th contact was to a 'new' country, Iceland; Luftur TF3LJ was the lucky lad who was making his first two-way on SSTV. Richard has now worked 112 countries, all but 4 confirmed with QSL cards from the distant station. (I wish my contacts were as conscientious!).

Equipment in use at G3WW is Wraase SC-1 SSTV/FAX converter with KB442 keyboard and Seikosha GP-250X dot matrix printer, Sony 10" b/w monitor and Taxan 12" colour monitor. Also Robot 400 (with several mods including 24 second frame) + 2xW9NTP memories for RGB colour. On the RF side an Icom 740, Heath SB220 linear, HyGain 205BA, Mosley 3 el. Elan beam and 40/80M lazy H at 56ft. For 2M he has FT-221R with Mutek front end and Dressler masthead preamp., also NAG 144XL linear and 2x 16 el. Tonnas at 70 ft.

Richard was prevented from visiting the BATC summer convention by a meeting with Gerald ZS6BTD and Jeremy G3NOX to discuss the SSTV forum at this year's Dayton Hamvention. The different standards used for SSTV b/w and colour transmissions were considered later when Mel W6VLH and xyl visited Richard, who won Mel over to 32 seconds b/w (I'm confused! When is someone going to explain all these competing standards and how you equip for them? What ever happened to good old 5FP7 tubes?!?).

Richard's recent two-way 2M activity includes G3CCH, G4DYB, G4NJI, G4IHZ, G14LKA, G8ASI, G3NOX and G3CDK. On and around 14230 GM4TXX, I2CEL, I3XQW, I6GKI, I0UVF, EA3BTG, EA3JY, EA8EV, EA8RP, F2RR, DL2GB.

Just before I close a quick mention of another testcard program for the 48K Spectrum computer. You get a colourful testcard with bars, circle and digital clock for £2.49. The effect is clear and smart, so why not send for one, to Malcolm Taylor G4YMT, 8 Four Stones Grove, Edgbaston, Birmingham, B5 7LW. That's all ... and it's quite a lot this time. Many thanks for all your letters and send more news for next time please to 71 Falcutt Way, Northampton, NN2 8PH. 73, Andy Emmerson, G8PTH.

MONITOR/TV CONVERSION

This circuit has certainly done the rounds. Of West German origin, it was sent to Television Magazine (to whom acknowledgement is made with thanks) by Jim Maden and Ian Roberts from South Africa. Judging by the comments of one or two members the design works well. It is reproduced here in the hope that it may help others.

The circuit enables a TV set with an isolated chassis to be adapted for receiver/monitor use.

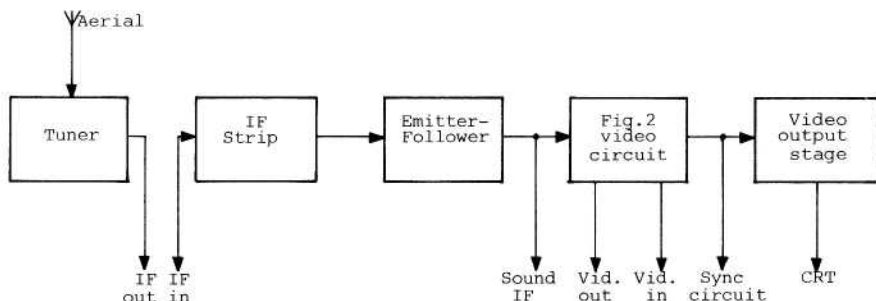


Fig.1. BLOCK DIAGRAM OF TV RECEIVER SYSTEM

RV1 should be adjusted so that the voltages at the base of Tr1 and the emitter of Tr5 are equal. For normal receiver use, link the i.f. and video input/output connections. The output from an external tuner can be fed to the i.f. input or, via a gain-controlled i.f. strip, to the video input. The original circuit used BC107's for Tr2-5 but seems to be happier with BC109.

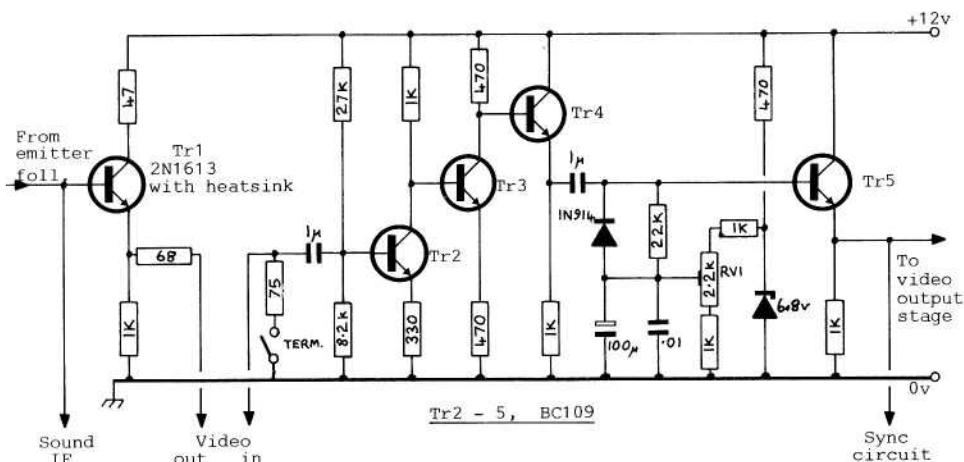


Fig.2 MONITOR/TV CONVERSION CIRCUIT

Who's Who?

Page 25 of the last issue introduced the club's new publicity man - Norrie Macdonald G4MBVU.

It is often interesting to know what committee members do for a living so I was particularly pleased to come across this piece in the Motorola staff publication "The Voice". The issue was for the second quarter 1984 and my thanks go to the Editorial team for permission to re-produce the article here.

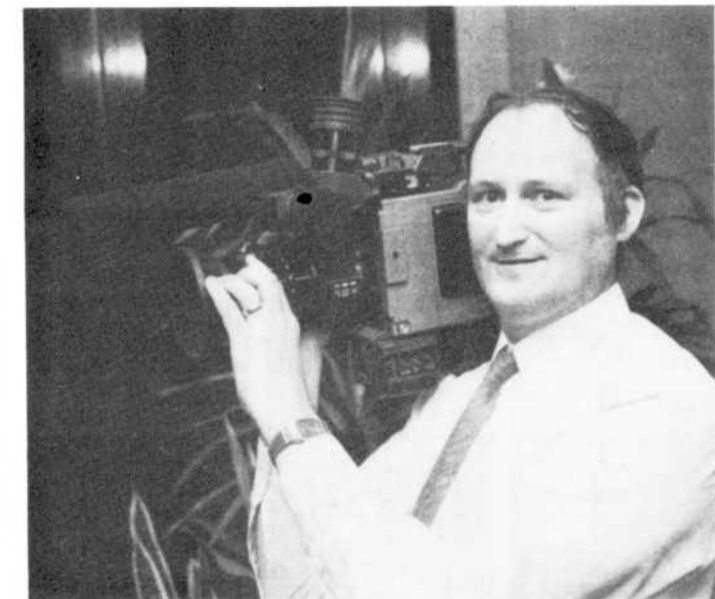
NORRIE'S FULL-TIME HOBBY

UNTIL April Norrie MacDonald made time for his hobby outside working hours — however, since his promotion to Video Service Manager he has been able to indulge his hobby during working hours!

Norrie has had a keen interest in video and television for a number of years and was Technical Manager of the students' TV group at Strathclyde University. Following on from this post he became Assistant Producer of the students television group at Glasgow University.

Norrie told *The Voice*: "There wasn't a lot of money in educational television, and when I was offered the post of Production Engineer with Motorola six years ago I was delighted.

"I had no idea then that I would be heading up this video service. The company at that time was not big enough to merit its own video communications system. However, with the growth of Motorola and management realising the importance of training, video has come into its own. It will be a decided advantage, particularly to the training scheme, but also as a means of communication from management to workforce.



"Many of our employees work on a shift basis. This makes it almost impossible for managers to speak to everyone if an important announcement is to be made. They would have to make an appearance at every shift giving out the same message again and again.

"With the video facility even our five-shift workforce

would not present a problem. With the flick of a switch the message can be seen at any time.

"At the moment we are using external tapes and my priority right now is ensuring that I have enough material whenever we need it. It comes to us from other Motorola facilities and vendors."

Norrie won't really be happy, however, until he is making Motorola's own in-house programmes which would include editing and sound mixing. How does Norrie relax? Running his own amateur TV station from his home in Hamilton of course! He boasts one of the leading amateur stations in the country.

A FM DEVIATION CALIBRATOR

By John Allsop G30GX

With the growing interest in amateur FM-TV in the microwave bands there has been a lot of discussion concerning choice of deviation. As receivers are generally optimised for a particular value of deviation it is desirable that all stations should be able to set their transmitters to the same standard.

Many newcomers, however, have found confusion over how deviation is specified in FM-TV. This confusion is hardly surprising, with some deviations being quoted as one or two MHz, others as 6MHz or satellite systems as 13MHz or more.

Satellite systems have been designed to provide clean pictures with signals only just above threshold, but they require a lot of bandwidth. We amateurs have to keep things a little narrower - at least on the lower frequency bands.

We can perhaps afford to have a little bit of noise in our pictures, so a Medium Deviation system might be more suited to our purposes.

DEFINING DEVIATION

For professional programme exchange, the CCIR have recommended a deviation of 8MHz per volt (MHz/V). They have also recommended a pre-emphasis characteristic for FM-TV. It is the adoption by amateurs of this latter that has perhaps been responsible for much of the misunderstanding about deviation. Once a pre-emphasis network is introduced to a transmitter it becomes necessary - indeed mandatory - to state the modulating frequency at which deviation is specified.

It should here be mentioned that for TV signals it is usual to refer to peak-to-peak values for deviation and voltage. It is also usual practice to state the deviation for 1-volt sinusoidal at the transition or crossover frequency of the pre-emphasis network. In the case of the CCIR 405-1 (625) network adopted for amateur purposes in the UK; this frequency is 1.512MHz.

If the 8MHz/V system is considered, then reference to the pre-emphasis characteristic of Fig.1 reveals that at 4.43MHz deviation will be 2.5dB greater, or about 10.7MHz/V. At LF, deviation will be 11dB smaller, or 2.255MHz/V.

PRE-EMPHASIS CURVE CCIR 405-1 (625)

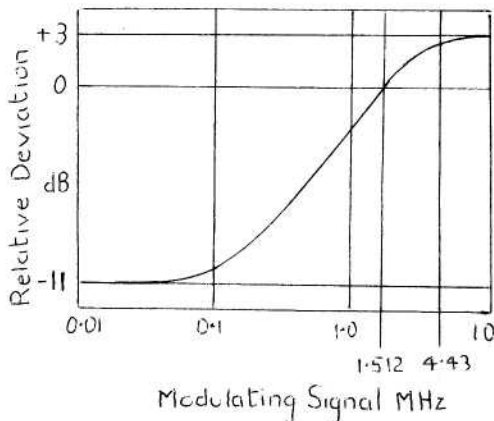


Fig.1

Clearly it is just as satisfactory to specify a deviation at LF provided that the agreed pre-emphasis characteristic is in use.

It is, in fact, the LF deviation that is of most interest to the amateur when setting up deviation. Most stations will have available a test generator producing syncs and peak white (even if they do refer to it as a camera!). These parts of the waveform can, for practical purposes be considered LF components.

MEASURING DEVIATION

The most convenient place to measure deviation is at the receiver - as for every transmitter there will be a receiver nearby (won't there?) The only extra that is required of the receiver is that the deviation/output voltage relationship should be precisely known. Sync tips to peak white deviation may then be read off the station oscilloscope or waveform monitor.

This brings us to the other important reason for measuring deviation on an LF component of the waveform. The deviation seen by the discriminator at higher modulation frequencies can be seriously affected by sideband distortion within the signal path. This is particularly the case where receiver bandwidth has been deliberately restricted in order to resolve a weak signal.

The unit described here generates a low frequency square-wave signal at intermediate frequency, having a precisely known deviation. The two frequencies required are produced by crystal oscillators. A diode switch driven by a low frequency oscillator alternately routes these reference oscillators to the receiver IF input (Fig.2). The difference between the two frequencies can be displayed, after demodulation, as a square wave, permitting calibration of the waveform monitor in terms of frequency deviation.

It is easier to obtain a clean square wave using two, continuously running oscillators than to switch crystals in a single oscillator.

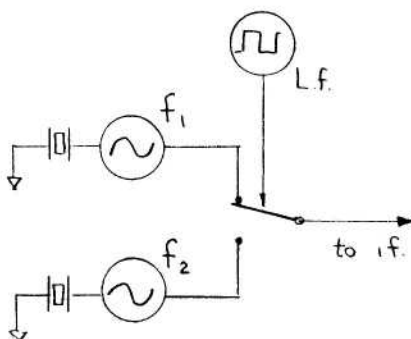


Fig.2 PRINCIPLE OF OPERATION

Operationally it would be most convenient to select crystals having a frequency difference which is equal to the required transmitter deviation, however, since this is still open to debate and junk boxes are seldom so obliging, the selection will be an individual one. The author having a 70MHz IF was fortunate enough to find 67 and 70MHz crystals. Setting gains for six divisions on the graticule allows a convenient display of 0.5MHz per division.

CONSTRUCTION (refer to Fig's 3 and 4)

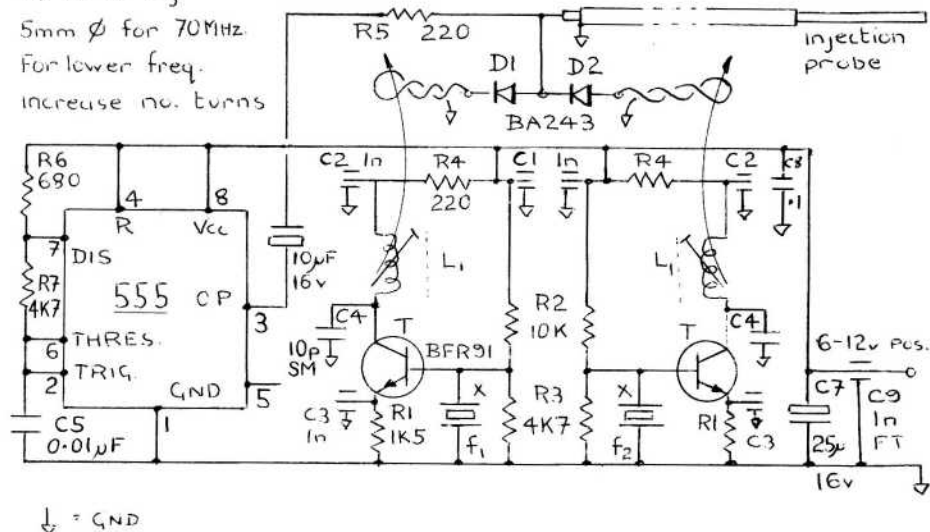
Layout of the calibrator is fairly non-critical, the original being built on copper laminate board. Each oscillator is laid out as the mirror image of

L_1 8t 26swg

5mm ϕ for 70MHz

For lower freq.

increase no. turns



C1,2,3 Feedthrough on Standoff. All resistors $\frac{1}{8}w$, 20% tol.

Fig.3

DEVIATION CALIBRATOR CIRCUIT DIAGRAM

the other making for a symmetrical construction. In this way the two oscillator coils may be kept at opposite ends of the board to minimise crosstalk. The output from each oscillator to the diode switch is coupled via a loop and twisted pair.

Cheaper transistors than those specified could be used. The diodes shown are P.I.N. types but it is likely that ordinary VHF diodes would suffice.

The low frequency oscillator was constructed on stripboard and the output taken to the junction of the switching diodes via a blocking capacitor and current limiting resistor which also serves as RF isolation. Component values are shown for a frequency of approximately 15KHz.

Other frequencies may be obtained by changing the value of C5. Frequencies greater than 100KHz should not be used as accuracy of readings will start to suffer.

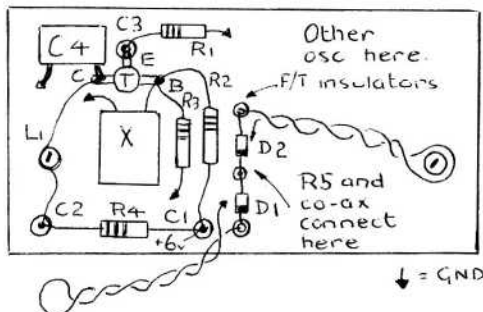


Fig.4.

LAYOUT OF CRYSTAL OSCILLATORS

INSTALLATION

Once it is established that the oscillators are operating, the following procedure will achieve optimum performance of the unit:

Connect a short length of coax to the diode junction and cut back about 2cm of screening at the other end so as to form a capacitive injection probe (Fig.3).

Place this probe close to the input of the LF amplifier-limiter and disable the receiver front end. A square wave should be displayed at the video output of the receiver. Withdraw the probe until the waveform is noisy and adjust the tuning and coupling links of the crystal oscillators to give equal noise on each half of the waveform. The final position for the probe will be that which just gives a clean display. This setting will have minimal effect on the receiver alignment and the probe may be left permanently in position.

For most purposes the receiver de-emphasis will be kept in circuit. Only if it is desired to display deviation at higher frequencies should the de-emphasis be switched out; for example, to check on the maximum deviation occurring on a transmission. In these circumstances it may be necessary to reduce video gain in order to avoid overload of video stages.

With de-emphasis out there will be some thickening of the calibration lines due to noise and crosstalk between the two oscillators. Also spikes on the waveform transitions will become very pronounced. Neither of these effects should appreciably detract from the accuracy of the measurement.

OPERATION

- (1) Disable the receiver front end and apply power to the calibrator.
 - (2) Set video and 'scope gains to give a convenient display of the known deviation.
 - (3) Switch off the calibrator and restore the front end.
- LF deviation may now be read directly off the display. Given that the standard pre-emphasis is in circuit at the transmitter, setting sync tips-to-peak white deviation is all that is necessary, the higher frequencies will take care of themselves.

WHAT SHOULD ATV DEVIATION BE?

There are several deviation standards used professionally. It is most likely that amateurs will adopt the deviation that is optimum for their local TV repeater. Possibly at a later date surplus professional LF filters, perhaps slightly out of spec may become available and dictate deviation. Where none of these constraints apply, the author suggests that an LF deviation of 2.255MHz might be a good compromise.

INTERNATIONAL ATV CALLING

144.750 MHz

CONTEST NEWS

These notes are being written as the entries for the 1984 International Contest are arriving.

From these it is evident that the high level of activity was not matched by anything that could be described as a lift, however even the high wind and heavy rain appears not to have dampened anyones enthusiasm. Quite a few more entries for 23/24cms this year and amongst the more surprising logs so far received are an entry from a station with an indoor antenna and an entry from G8GKQ who worked only 7 stations 4-PAØ'S 2-ON'S and 1-DJ. He has owned up to being presently stationed at RAF Bruggen and in fact operated as DA4DG.

UK results will appear in the next issue.

WINTER CUMULATIVES 1985

As a response to pressure we have decided to add a slow scan section to this contest in an effort to encourage some more actual activity on that mode. This is being done as an experiment and we hope that there will be rather more entries than the last SSTV contest attracted about 4 years ago. (2)

Please also note that this will be the last ATV contest in which the "old" QRA locator codes will be used. It will be "Maidenhead" from then on so please get on with reprogramming your contest scoring programmes.

DATES: Jan 17/25 and Feb 2/10 1985

TIME: 20.00 - 23.00 GMT each day

BANDS: FSTV on 70 and 23cms. SSTV on 2 metres

EXCHANGES: The following data is to be exchanged:

1. Code-group, which consists of four digits, individually chosen by each entrant, i.e. 1865 or 9732. The code group must be exchanged in video only.
2. Call, QTH-locator, report, serial number starting at 001 each session, this data to be exchanged via video or phone. Should one of the stations fail in receiving the picture of the other, the scores of both stations are to be halved.

CONTACTS: The same station may only be contacted once per band on each night.

FSTV

Logs have to be entered per band operated - a maximum of three sessions will count for points - if you operate on more please enclose details for checking purposes.

A) Two-way QSO on 70cm: 2 points/km

B) Two-way QSO on 23cm: 8 points/km

Multi-op stations may only use one callsign.

Crossband QSO's must be entered in the log for the transmit band.

Please QSY from the ATV calling channel of 144.750 as soon as contact has been established. Please keep vision transmissions as short as possible.

S.S.T.V.

A maximum of 3 sessions will count for points - if you operate during all 4 please send details for checking purposes.

Scoring will be 2 points/km for a 2 way video exchange. Multi-op stations may only use one callsign.

LOGS

Must include postal address, locator, station details and total claimed score and must be mailed not later than 28th February 1985:-

G. SHIRVILLE G3VZV
18 Church End,
Milton Bryan,
Milton Keynes,
Buckinghamshire MK17 9HR.

EDITORS NOTE

During the International contest there were a number of stations operating on 144.60 MHz which is the RTTY calling channel, and similarly on 144.775 MHz - a RAYNET frequency.

I have been asked to remind members of these facts and to ask that you first ensure the frequencies are not being used before using them.

THANKS

BATC NEWS HOTLINE

'PHONE LEICESTER (0533) 600108



COAXIAL CONNECTORS

Series SMB/SMC/SMD

This final part in the 'Coaxial Connectors' series concentrates on the miniature, high quality series SMB, SMC and SMD. As amateurs often confuse the three types they may be briefly described thus: SMB - snap-on connection, SMC - screw coupled and SMD - slide-on. Since SMD are similar in specification to SMB but without the snap-on indent, this article will make mention of SMB and SMC only.

Unlike other connectors covered in this series, the plugs - ie. the item normally attached to a free cable - have female centre contacts whilst sockets and jacks - those items normally fixed to panels - have male centre contacts. The tables of connector styles use the abbreviations (f) and (m) to highlight this and avoid confusion.

The connectors have a wide range of applications but are especially useful for interconnecting low power RF modules and for signal input and output connections. Although not shown here a full range of connectors for directly mounting onto printed circuit boards is available, making them ideal for UHF and microwave use.

Construction includes gold plated brass bodies and gold plated beryllium copper or brass contacts set in PTFE insulators. Nickel plated versions may also be encountered by amateurs.

In general, SMB connectors maintain full performance to over 4GHz whereas SMC may be used up to 10GHz.

Plugs and jacks having assembly references 3 and 4 apply to semi-rigid cables. Since these cables are not often encountered by amateurs, only assembly instructions for flexible cables are given. A glossary of terms and cable group tables may be found in CQ-TV122.

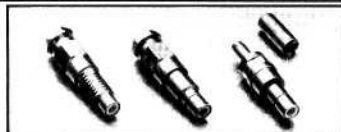
Straight plugs



Elbow plugs



Free jacks



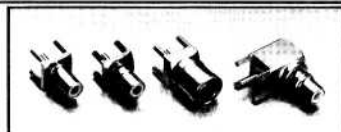
Bulkhead plugs and jacks



Bulkhead sockets



PCB plugs and sockets

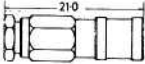






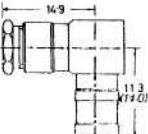
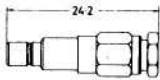


As with all the articles in this series I have picked out only those connectors which, in my view, are most likely to be found in amateur shacks. Greenpar Connectors however offer a vast range of connectors and related products to suit all applications which are adequately described in their fully illustrated catalogues available to the trade. Any queries concerning Greenpar products should be directed towards your local stockist.

I should like to thank Greenpar Connectors for permission to publish details of their products and especially Mr. J Stockdill, Marketing Director and Mr. Christopher Trim for their help and advice in compiling this series.

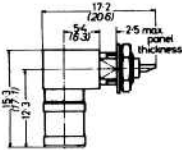



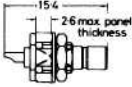
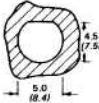
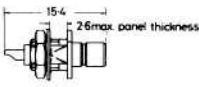
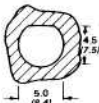
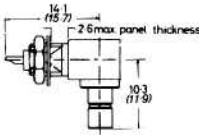
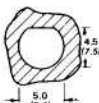
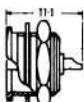
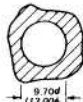
Series SMB/SMC/SMD

CLAMP PLUGS AND JACKS

Connector outline	Nominal Impedance (ohms)	Assy data fig.	Greenpar No.			Cable clamp	Cable Groups					
			SMB	SMC	SMD		22	24	73	285	350	
Plug — Straight (f) 	50	1	65201	65301	65601	C	•	•				  SMB — Snap on   SMC — Screw on   SMD — Slide on
	50	3	65201	65301		C	•		•	•		
	75	1	67201	67301	67601	C	•				•	
Plug — Right angle (f) 	50	2	65202	65302	65602	C	•	•				
	50	4	65202	65302		C	•		•	•		
	75	2	67202	67302	67602	C	•				•	
Jack — Straight (m) 	50	1	65206	65306	65606	C	•	•				
	50	3	65206	65306		C	•		•	•		
	75	1	67206	67306	67606	C	•				•	

f) denotes female centre contact.
m) denotes male centre contact.

BULKHEAD PLUGS (Contd.) AND BULKHEAD JACKS

Connector outline	Nominal Impedance (ohms)	Greenpar SMB	No. SMC	SMD	Panel Piercing
Plug – Solder spill right angle (f) 	50 75	65222 67222	65322 67322	656222 676222	 SMB – snap on  SMC – screw on  SMD – slide on
Jack – Solder spill rear mount (m) 	50 75	65208 67208	65308 67308	65608 67608	
Jack – Solder spill front mount (m) 	50 75	65218 67218	65318 67318	65618 67618	
Jack – Solder spill right angle (m) 	50 75	65209 67209	65309 67309	65609 67609	
Jack – Solder spill recessed (m) 	50 75	65204 67204		65604 67604	
(f) denotes female centre contact, (m) denotes male centre contact.					

Assembly Instructions

Fig. 1 Straight plugs and jacks, pressure sleeve cable clamp.

1. Place clamp nut, washers and gasket over cable.
2. Trim outer sheath from cable, as indicated, and splay braid.
3. Insert ferrule between dielectric and braid, slitting outer sheath if necessary.
4. Check that dielectric is flush with front face of ferrule.
5. Trim surplus braid.
6. Slide rear insulator onto dielectric and into ferrule.
7. Tin centre conductor.
8. Fit contact over centre conductor, so that contact shoulder butts against shoulder of rear insulator.
9. Hold contact and cable firmly together and solder.
10. Slide front insulator over centre contact (plug only).
11. Press sub-assembly into body as far as possible.
12. Engage and tighten clamp nut (typical tightening torque 3.5 Nm).

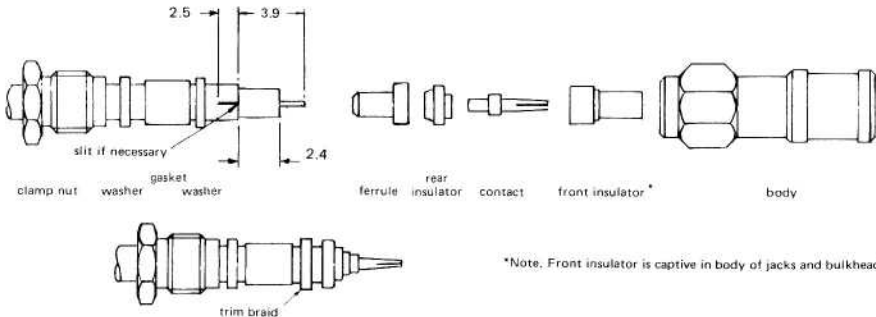
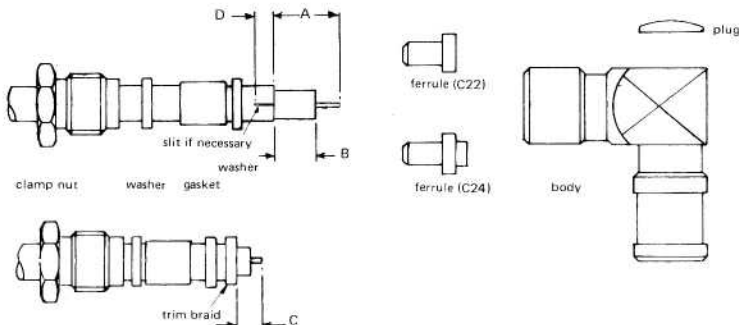


Fig. 2 Elbow plugs, pressure sleeve cable clamp

1. Place clamp nut, washers and gasket over cable.
2. Trim outer sheath from cable, as indicated, and splay braid.
3. Insert ferrule between dielectric and braid, slitting outer sheath if necessary.
4. Check that dielectric is flush with front face of ferrule.
5. Trim surplus braid.
6. Tin centre conductor.
7. Slide clamp nut, washers and gasket up to ferrule.
8. Place sub-assembly into connector body.
9. Engage and tighten clamp nut (typical tightening torque 3.5 Nm).
10. Solder centre conductor into slot in contact.
11. Insert plug into body and flatten to retain.

Nominal Impedance	Dimensions			
	A	B	C	D
50	4.7	3.2	3.4	2.5
75	8.0	6.0	7.0	2.5



MEMBERS SERVICES

Items from these lists are available to club members only.
This list supercedes all previous ones.

QTY	PRINTED CIRCUIT BOARDS	EACH	P&P	TOTAL
_____	'Project 100' sync generator (CQ-TV100)	£3.00	0.30	_____
_____	TX-9 video/audio in/out (CQ-TV119)	£2.25	0.30	_____
_____	FM-TV demodulator (CQ-TV122)	£3.00	0.30	_____
_____	Wide-band 70cm ATV tuner (HB1)	£3.00	0.30	_____
_____	Amateur television receiver (HB1)	£1.50	0.30	_____
_____	Electronic character generator (HB1)	£3.00	0.30	_____
_____	Colour test card (set of 3-double-sided)	£15.00	0.60	_____
_____	Horizontal aperture corrector (HB1)	£3.00	0.30	_____
_____	PAL colour coder (HB1)	£3.00	0.30	_____
_____	Vision switcher matrix (HB2)	£4.00	0.30	_____
_____	Vision switcher logic (HB2)	£4.00	0.30	_____
_____	Vision mixer (HB2)	£4.00	0.30	_____
_____	70cm VSB transmitter-7 boards (HB2)	£15.00	0.40	_____
_____	SSTV pattern/sync generator (HB2)	£3.00	0.30	_____
_____	Character colourizer,(printed legends HB2)	£5.00	0.30	_____
_____	Piggy-back keyboard (HB2)	£2.25	0.30	_____
_____	70cm TV transmitter (TVA and CQ-TV122)	£3.00	0.30	_____
_____	ATV up-converter (TVA and CQ-TV112)	£2.25	0.30	_____
_____	Video filter (TVA and CQ-TV122)	£1.00	0.17	_____
_____	SPG, greyscale, char gen (Ham Radio Today)	£4.set	0.60	_____
_____	G3WCY SSTV to FSTV converter & reprint (Rad Com)	£10.set	0.60	_____
_____	G4ENA modifications for above CQ-TV127 - set of 4	£5.set	0.30	_____
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_____	BATC test card - with data sheet	0.50	0.24	_____
_____	BATC reporting chart (illustrated)	0.12	0.20	_____
_____	BATC lapel badge - diamond - button hole	0.40	0.17	_____
_____	BATC lapel badge - round - pin fastening	0.50	0.17	_____

BATC callsign* lapel badge-pin fastening	£1.50	nil
*Write callsign CLEARLY. Sent by supplier		
BATC key fob	0.60	0.17
BATC equipment stickers - 1" round	0.15	0.17
BATC windscreen stickers - 2.5" round	0.10	0.17
1" Vidicon scan-coils (low Z focus coils)	£6.00	£1.20
1" Vidicon scan-coils (high Z focus coils)	£6.00	£1.20
2/3" Vidicon scan-coils	£6.00	0.80
Vidicon bases - 1" or 2/3" (state which)	0.50	0.17
TV camera lens mounts - 'C' type	£1.00	0.24
13.14MHz TV TX crystal (Hbk 2)	£5.00	0.17
108MHz TV TX crystal (TV for Am)	£7.00	0.17
5MHz SPG crystal (P100)	£2.75	0.17
TBP28122 PROM. Pre-programed for colour	£10.00	0.25
test card circle. (eqt.745471)		
2732 EPROM. SSTV program (HB2)	£12.00	0.17
4.433618MHz PAL colour subcarrier crystal	£2.75	0.17
HC18-U (wire leads),		
	TOTAL	£

*HB1 & HB2 = BATC Handbooks.

TVA = TV for Amateurs

POSTAGE £

TOTAL ENCLOSED £

CAMERA TUBES & ORDERING INFORMATION

Members requiring EEV Leddicon, EMI 9777 Ebitron, 9728, 9706, 9677 (1" EMI) vidicons or 9831 (2/3" EMI) vidicon should enquire for the latest prices and delivery. ALL enquiries needing a reply should include a SAE or IRC.

OVERSEAS MEMBERS should ask for a quotation of postage costs before ordering.

PUBLICATIONS must be ordered separately from the Publications Department.

CHEQUES are payable to "The BATC" and should be for English banks only please

ORDERS TO:- Mr. P.Delaney. 6 East View Close, Wargrave, BERKS RG10 8BJ, England. Tel: 073 522 3121

BLOCK CAPITALS PLEASE

name	call
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PUBLICATIONS

QTY	PUBLICATION	PRICE EACH	UK P&P	TOTAL inc p&p
	AMATEUR TELEVISION HANDBOOK vol.1 by J.Wood G3YQC and T.Brown G8CJS (160gm)	£1.50	0.40	
	AMATEUR TELEVISION HANDBOOK vol.2 by T.Brown G8CJS (155gm)	£2.00	0.40	
	TV FOR AMATEURS by J.Wood G3YQC (85gm)	£1.50	0.25	
	CQ-TV BACK ISSUES. The following issues are still available although stocks of some are low. Please circle those required.			
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	*Please estimate appropriate postage (approx 90gm per copy)			
	RE-PRINTS. Photocopies of any article from past issues of CQ-TV are available.	0.20 per sheet	0.20	
	INDEX. All main articles in past issues of CQ-TV and 4 Handbooks. Inc. page count, (essential for ordering re-prints). (40gm)	£1.00	nil	

TOTAL £ _____

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BATC PUBLICATIONS, 14 LILAC AVENUE, LEICESTER, LE5 1FN, ENGLAND

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CLUB LIBRARY

The BATC library, though not huge, may well contain that article or paper that you have been searching for.

A duplicated list of the libraries contents is available to members upon receipt of a stamped addressed envelope, or you may send or telephone your specific requests for information. Should the material required not be to hand the librarian will try to obtain it for you.

At present the library contains a large number of manuals for Marconi, Pye, E.M.I. etc., broadcast equipment, back-issues of CQ-TV, A5, Der TV Amateur etc., and a vast amount of Mullard publication notes. There are some historically interesting letters and photographs from the very early days of the Club. Also included are some (mostly early) audio tapes and lectures which are available for loan.

Paul Marshall G8MJW, 62 Rutland Road, Chelmsford, Essex. Tel: 0245 57681.

EQUIPMENT REGISTRY

The BATC Equipment Registry exists to help members who have equipment for disposal, or who wish to purchase some specific item. Send a list of your 'wants' or 'disposals' to the address below and, during the six months for which your application will be held, the registry will attempt to put you in touch with someone who may be able to help.

Alan Watson, "Somerby View", Bigby, Barnetby, Lincs.

VIDEO LIBRARY

There are a number of video tapes available for free loan to groups and societies. The tapes include BATC demonstrations and exhibitions, programmes on ATV plus a good selection of material from other countries showing how they operate amateur television and demonstrating ATV repeaters.

If you have any ideas or material for future programmes, Trevor Brown would be pleased to hear from you.

Trevor Brown G8CJS, 25 Gainsbro Drive, Adel, Leeds LS16 7PF. Tel: 0532 670115

☆☆☆ **ATV NEWS HOTLINE** ☆☆☆

RING 0533-600108 NOW!



A BATC news service



IN THE STUDIO

Part 2 - STUDIO CAMERAS

By John Goode.

INTRODUCTION

In this article I am taking the term "studio camera" to mean a video camera that is capable of being incorporated into a multiple-camera set-up. It must therefore be capable of being synchronised to other video or sync sources - the so-called "external sync" mode of operation.

It would seem to me that "studio cameras" divide themselves into three categories:-

- (1) Broadcast Studio/OB cameras (£30,000+);
- (2) "Multirole" (Studio or ENG) medium quality 3-tube cameras (c.£6,000);
- (3) Lower cost "Multirole" single-tube cameras (c.£2,500).

It is not the purpose of this article to go into the circuitry employed in these types of camera, but to describe them as "systems", showing how they conform to a standard way of arranging things for studio operation.

I have chosen one type of camera from each of the above categories. They are:-

- (1) Marconi Mk.VIII Studio Camera;
- (2) JVC KY2000/2700 Series Multirole Camera;
- (3) Sony DXC1800P Single Tube Camera.

These types are fairly typical of their class (although the Marconi is a fairly old design now); however, they are chosen because the writer has access to technical information on them!

Before describing the cameras themselves, it is necessary to give some background to professional studio operation, as this has a bearing upon camera system design.

STUDIO ARRANGEMENTS

For those readers who are not familiar with studio operation, I shall outline the arrangements in a broadcast studio.

For a professional level of presentation, a studio TV cameraman is not expected to have to be concerned with the technical quality of the pictures he supplies - only the "artistic" content. This means that he can concentrate on framing his shots and zooming, as required. Technical functions such as lens aperture (controlling video level), colour balance, lighting, matching different cameras, etc., are all controlled remotely by vision and lighting engineers situated in a separate control room. This means that the studio

camera is traditionally designed in two parts - the camera "head", situated on the studio floor, and a C.C.U. (Camera Control Unit) situated in the control room allowing remote control of virtually all camera functions.

Traditionally, only the bare essentials are put into the camera head, in order to make it as small and light as is possible; therefore almost all of the video processing and power supplies are in the C.C.U. With this arrangement, it is normal to refer to the system as a "camera channel".

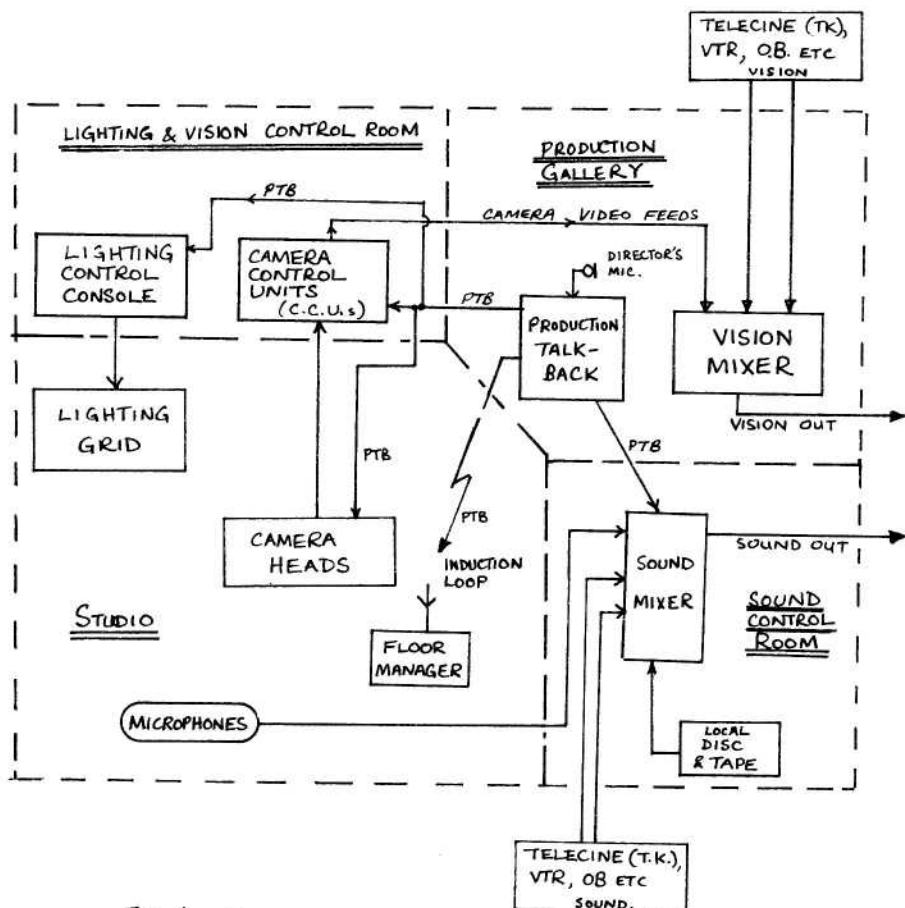


FIG 1. BROADCAST STUDIO

NB:- IN A NON-BROADCAST STUDIO, THE GALLERY, SOUND, VISION & LIGHTING CONTROL ROOMS MAY ALL BE COMBINED.

In a broadcast studio, the technical areas are usually divided into three (see Fig.1):-

(1) The Production Gallery.

This is where the Programme Director and his staff oversee the programme. Vision mixing is carried out here. The director is linked by means of a complex talkback system to the cameras and other technical areas;

(2) The Vision and Lighting Control Room.

In here are situated the C.C.U.s and the Lighting Control Console. These are operated by the Vision ("racks") Engineer and the Lighting Supervisor. They work closely together to maintain picture quality and balance, together with any artistic lighting effects that may be required.

(3) The Sound Control Room.

This is equipped with sound mixer, grams, audio tape etc., controlled by the Sound Supervisor.

Smaller non-broadcast studios will not necessarily be divided in this way, but all multi-camera studios will require remote control of camera balancing and line-up if good quality pictures are to be provided.

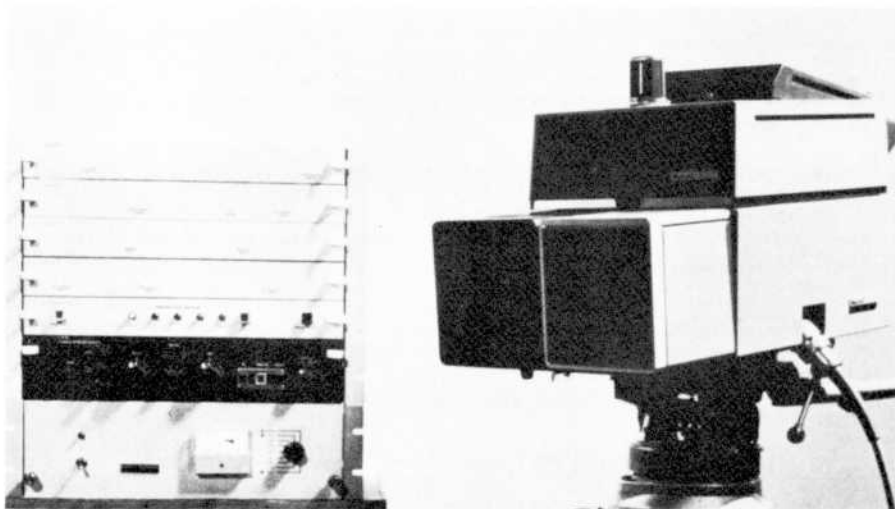


Fig.2

MARCONI Mk VIII CAMERA CHANNEL

THE MARCONI Mk.VIII.

The first camera we will look at is the Marconi Mk.VIII studio camera channel. Although this is an old design now, it achieved notability when introduced in the mid-seventies as the first successful camera channel with full automatic line-up facilities. As the reader will realise, this is a "no compromise" camera, designed to give the highest performance possible at the time of its introduction. The Mk.VIII is a "traditional" design in the sense that it is a "head" and "CCU" design. It is illustrated in Fig.2.

The layout of the camera head is fairly unusual. The right-hand side consists of an optical unit comprising an integral zoom lens, prism unit and pickup tubes. These are 30mm Leddicons for maximum resolution, and their large size means that the rest of the optical unit must be large too. The electronics for lens servo, head amplifiers, intercomms, scanning circuits etc., are mounted on the right-hand side. As is normal practice with studio cameras, a tiltable viewfinder (monochrome) is fitted.

All studio cameras must be fitted with what may be termed "production" facilities, essential to programme making, but nothing to do with the camera electronics as such. These are (1), the intercomm. or talkback system, allowing the cameraman to receive instructions from the Programme Director, or to call the CCU Operator if required; (2), the "tally-lamp" circuit, giving both cameraman and artistes an "on-air" indication, by means of a red lamp being illuminated. These lamps are driven by logic circuits within the vision mixer, and as well as giving indications on the cameras, they also light lamps on the CCUs, and on the appropriate preview monitor in the gallery.

A simplified block diagram is shown in Fig.3, showing the division of circuits between head and CCU. As stated previously, the Mk.VIII was noted for its automatic line-up system. This adjusts white balance, black balance, registration (centring and scan size adjustment) of the three primary images, using a built-in diascope.

The adjustments are carried out by motor driven potentiometers, and can be manually over-riden if so desired.

The CCU is designed as several rack-mounted units, and various units can be supplied in order for the camera to be able to work on different world TV standards.

This camera channel would normally be synchronised using the full range of SPG pulses and subcarrier. Unlike the newer types of camera, an in-built SPG that can be externally genlocked is not normally supplied - although due to the CCU being a rack system, no doubt an SPG could be supplied and fitted to special order.

THE JVC KY2000/2700 SERIES MULTIROLE CAMERA.

The term "multirole" refers to the fact that the camera can be used on its own, direct into a portable VTR (the so-called Electronic News Gathering mode), or, with the addition of an optional remote unit (RCU), as a studio camera with the full range of production facilities.

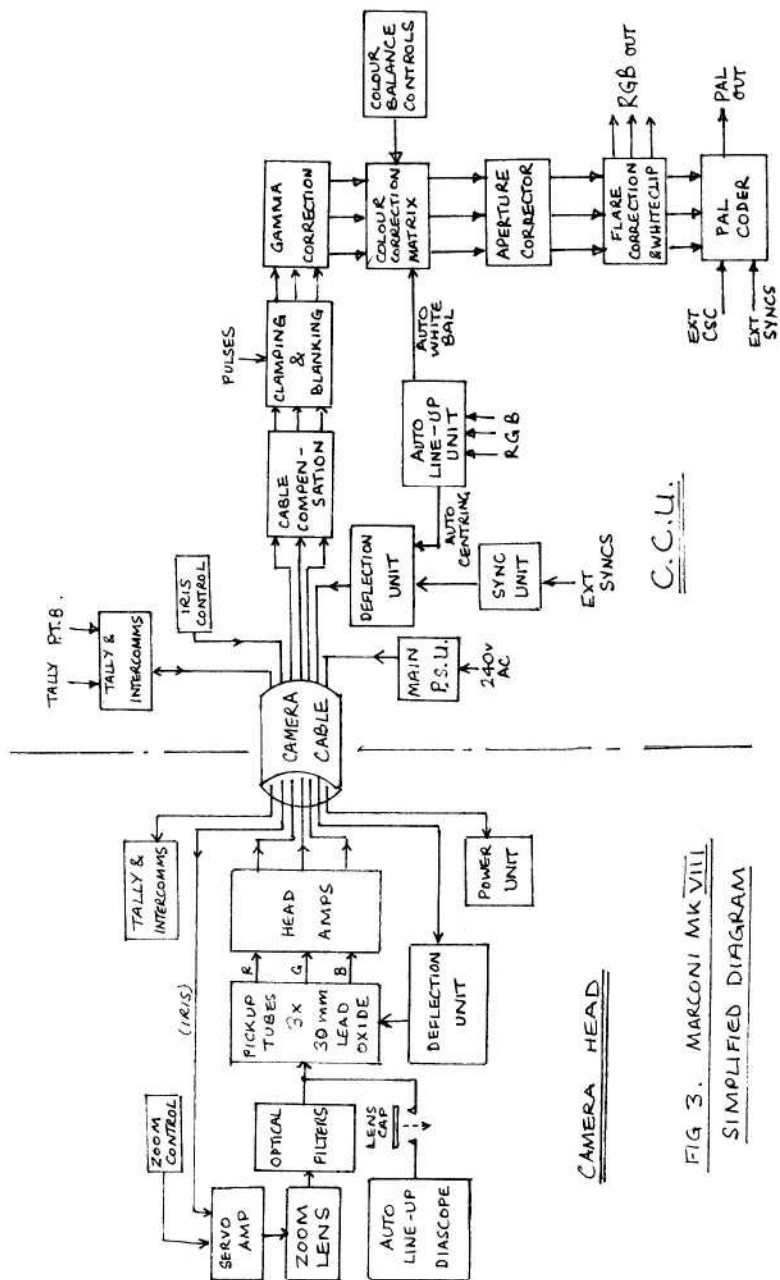


FIG 3. MARCONI MK VIII
SIMPLIFIED DIAGRAM

Fig.4(a)

JVC KY2000/KY2700 CAMERA



RS-2000E REMOTE CONTROL UNIT



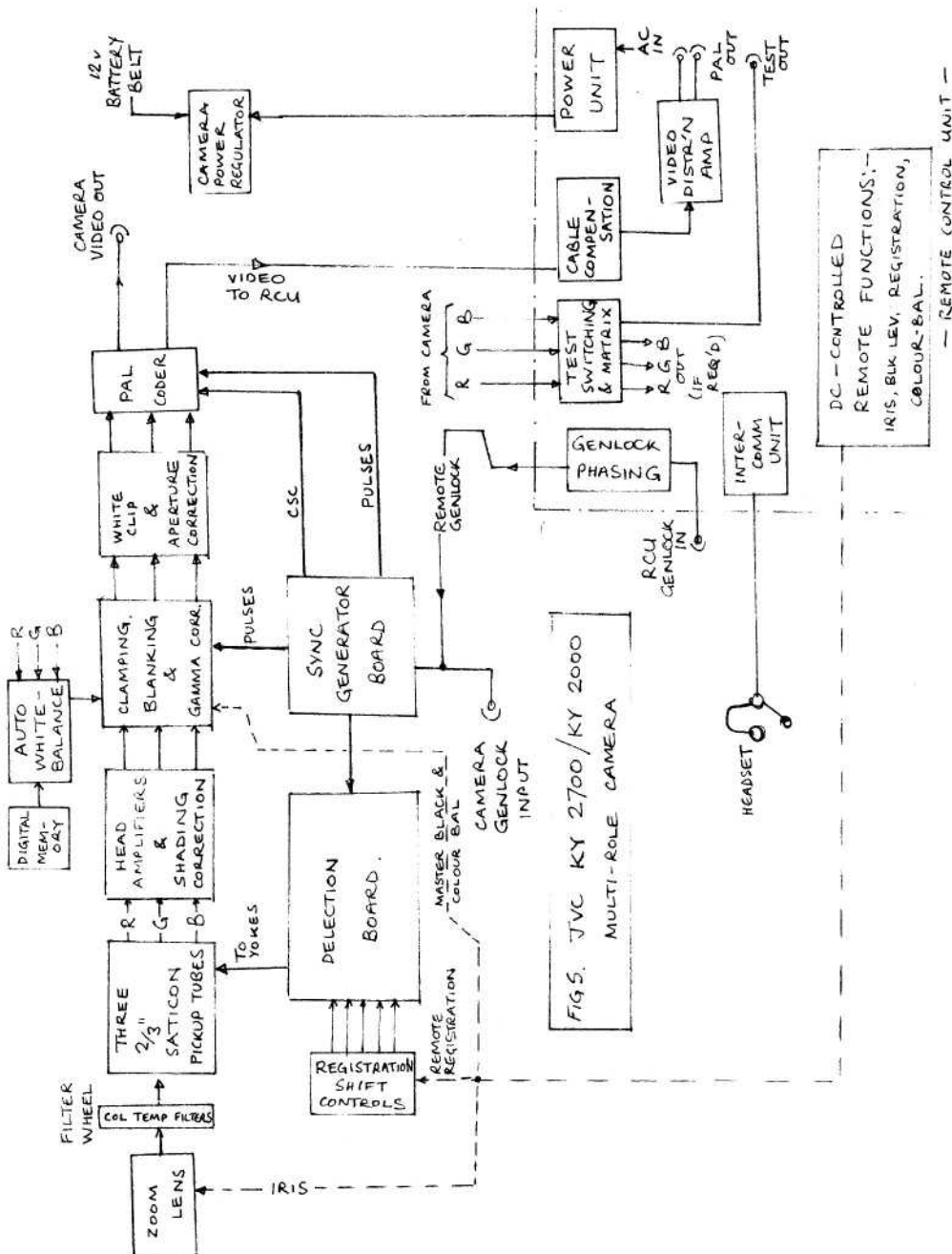
Fig.4(b)

This type of camera has been made possible by the development of single-chip genlock SPGs. They provide internal syncs to full broadcast specification, and can genlock to any external black-burst or composite video signal.

The camera is illustrated in Fig.4a, and is shown in the E.N.G. mode. For studio use a 112mm tiltable viewfinder is available, with rear operated handles for lens zoom and focus. Fig.4b shows the RCU, giving remote control of lens iris, black level, colour balance, registration and providing intercomm. and tally-lamp facilities. Fig.5 is a simplified block diagram.

The multirole camera is a later development of the "traditional" studio camera, made possible by the development of specialised L.S.I. chips for many of the camera's processing circuits, and by the improved performance of smaller pickup tubes. As can be seen from the block diagram, virtually all the functions of the Marconi Mk VIII camera channel have been incorporated into the JVC's camera body. The RCU is only necessary if full studio facilities are required.

The differences between the KY2000 and the KY2700 models are that the KY2700 has an improved deflection circuit, giving slightly improved registration performance; in addition, it also has a more elaborate aperture correction system.



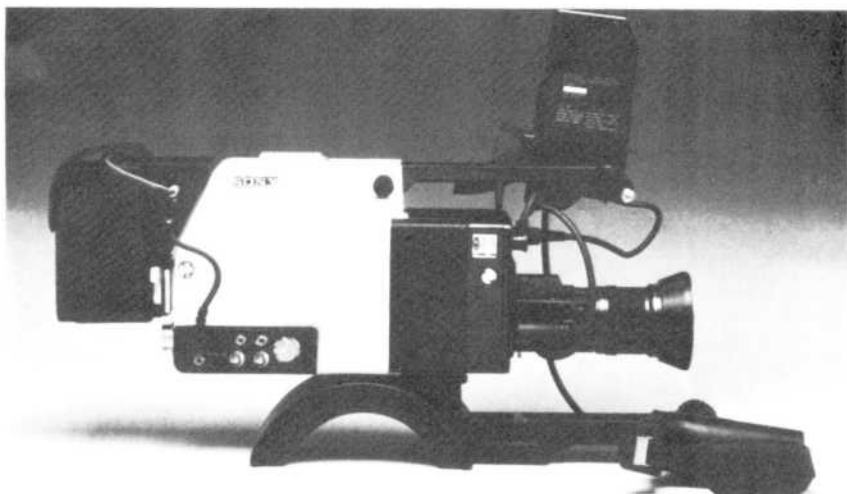


Fig.6(a)

SONY DXC 1800P



Fig.6(b)

DXC 1800P REMOTE CONTROL UNIT

THE SONY DXC1800P SINGLE-TUBE CAMERA.

This is illustrated in Fig.6a in ENG mode, and, as it is capable of multirole operation, Fig.6b shows its optional RCU. (Note that it is shown combined with a small picture monitor in a 19" rack mount - the RCU is the unit on the right). Fig.7 shows a simplified block diagram of the camera and RCU.

Because the DXC1800P is a single tube camera, no registration adjustments are necessary. However, the Trinitron system produces a frequency-multiplexed luminance/chrominance output that must be trans-coded into PAL. At no time are RGB signals available, and so colour balance adjustments are made to the signals in YUV form.

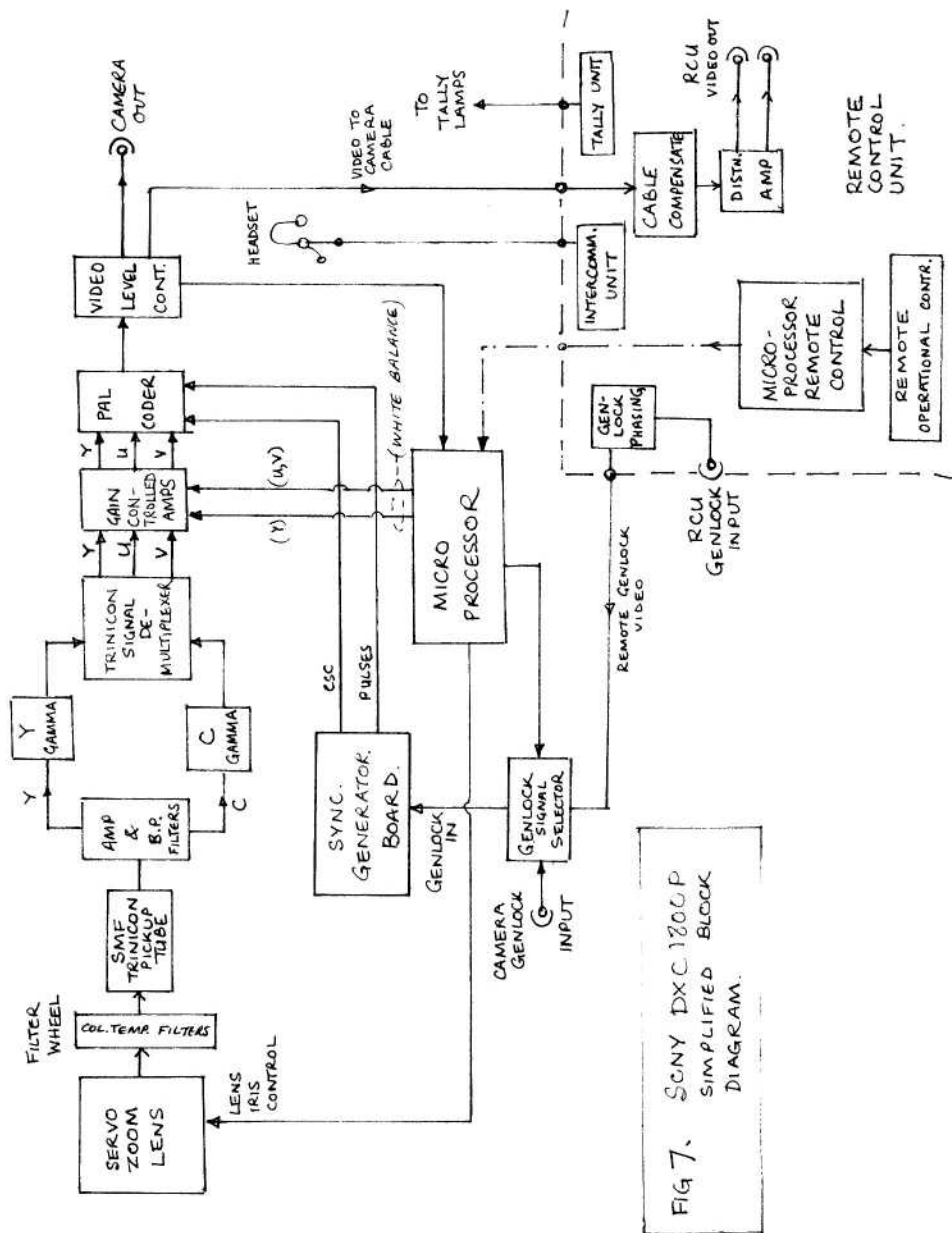


FIG 7. SONY DXC 1200P
SIMPLIFIED BLOCK
DIAGRAM.

As can be seen from Fig.7, all operational adjustments are under the control of a microprocessor in the camera. This means that when the RCU is connected, all the remountable functions are extended by remotely controlling the microprocessor digitally. In addition, tally lamps, intercomms and power are supplied via a camera cable to the camera.

SUMMARY.

Although the three cameras described are quite different from a design point of view, they all conform to the "standard" for studio cameras in that there are certain essential features in common that are necessary for multi-camera work. These are:-

- (1) Must be externally synchronised.
- (2) Must have intercomm. and tally lamps.
- (3) Must have the following facilities remountable:-
 - a) lens iris
 - b) black level
 - c) colour balance
 - d) registration (3-tube cameras only).
- (4) Must receive power via the camera cable.

It is worthwhile noting that the "multirole" camera is essentially a non-broadcast concept (in the UK, anyway), brought about for economic reasons so that the same camera can be used for studio and ENG work. At the top end of the market the broadcasters can afford to have "dedicated" studio and ENG cameras.

In the next part we will have a look at some of the established ideas in vision mixers.



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PRESS, P.R. AND THINGS

By Peter Dronfield G4RNA

I began reading "Room at the Top" in the last issue with the anticipation of the alcoholic about to taste his morning dram. The sun was tinting the top of my aerial stack and a faint odour of coffee betrayed the presence of G4RNA.

I rubbed my eyes, still heavy and scanned the crystal plains rolling below my 1250ft hill.

What a beautiful morning. Full of good things. All this and the ATV Summerfun contest results too. There's nothing like a bit of success to spur one on and I came fourth.....or else my QTH came fourth and I helped a bit: You have to be dedicated to spend winters at this altitude, however that could be another story.

Back to the article. Our Ed. says the article is "tongue in cheek", but bits of it were "foot in mouth". Trevor refers to me as some mystery man who didn't seem to be on the CQ-TV mailing list, perhaps he's a bit out of date? I'm also QTHR and very active on 70cm., funny though, I can work 80 miles radius but not seen pictures from Trevor, we've spoken a few times but never met VISUALLY Hi. Next, there seemed to be an inference that I just bought a second-hand station and that's all.....Oh dear, very annoying but not quite so offensive as the parenthetic description following that; (I quote) 'Obviously some sort of idiot'. By definition an idiot is someone incapable of rational conduct, this inclusion may go some way to describing itself as I feel both conduct and rationality are lacking here.

Well that's enough complaining; what follows is intended to be constructive comment and I hope will serve anyone who has to try to penetrate media coverage of ATV with a little truth and meaning.

If you view newsworthiness as a kind of co-efficient of elasticity and couple this with the concept that it's easier to ridicule than to communicate technicalities, you have what seems to be the basic principle behind newswriting to satisfy a reporters' lust for a story often at the expense of truth, meaning and the reputation of the interviewee.

It all started when a young lad saw my pictures. I had the unsolicited attention of one local paper, two radio stations, one national paper and two TV networks.....I also had a visit from two official gentlemen! The Big story was erroneous - It was about PIRATE TV., PERSONAL BROADCASTING and ENTERTAINING -nothing to do with amateur TV, the BATC, the conditions of our licence or anything that would serve us well.

I knew that I could ill afford the time to prepare anything worthwhile and copy is not in ones hands anyway. It would be good to see a proper plan in the handling of BATC PR that would serve the efforts and aspirations of all our members well and prevent dangerous misconceptions about ATV work.

I deflected the reporters of all but the local paper who I managed to convince that the de-bugging of the Pirate TV story with a proper story about RSGB, licencing etc. was in fact all he could hope for. Result: 50% fact, 20% fiction and 30% ridicule - funny, I wonder if Trevor ever worked for the Sheffield Telegraph? Hi Hi. Well anyway, I think we are all flattered by the attention of the press. I was but once reported twice shy and no regrets since.

The morning after Trevors' big day, a phone call.....

BBC TV Are you the man in the Telegraph story?
SELF Yes.....?
BBC TV We would like to do a news item about your TV station.
SELF I guess you're a bit late, ITV ran one last night.
BBC TV Oh....er....did they have you?
SELF No, they were in touch but I was away.
BBC TV Can we call this afternoon, We'd like to do a story?
SELF I'm sorry, I can't see why, there can't be much mileage left.
BBC TV Oh....er....can you get a Frenchman on the screen and we'll all come this afternoon?
SELF Well sorry, it doesn't work that easily.
BBC TV Um....Have you spoken to the Falklands?
SELF No.
BBC TV Has anything interesting ever happened to you?
SELF Not really. No maydays or yellow jack (I chuckled).
BBC TV (With oblivion to the works of Hancock) Well er....we may ring back.

THEY DIDN'T. I was glad, for I knew that the satisfaction gained from my activities on ATV are not readily understood and playing TV on TV is something that needs careful preparation.

I put down the phone, rainbow refractions glinted from the ancient glass of a distant farmhouse, thirsty cattle belowed in the heat of my alpine haven.

I scanned the chequered lands before me, looking for the top of York Minster, and little did I know, looking DOWN upon Emley Moor, that this was Trevors' 'Room at the Top'.

Thank you John Wood for listening to my outrage and thank you Trevor Brown for the wonderful technical stuff, and all the fine works of countless others who contribute to the BATC.

It's tough trying to please all the people etc., and harder when it's done for love rather than profit so perhaps we should all do more to help.



In this sense I have aired my complaint, I now look forward to an opportunity of helping the BATC whenever and wherever possible.

NB. Any station wanting skeds or tests please contact (QTHR).
ZN43B 1250ft ASL, QRV HF, 2, 70 and soon 24cm FM-TV.

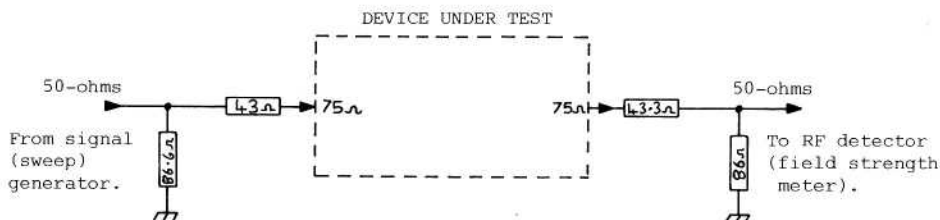
Sorry about the inaccuracies Peter, one prints what one is sent. - ED.

CQ-TV120 70MHz FILTER NOTES

Way back in CQ-TV120 there appeared a design for a 70MHz IF filter. It seems that there were one or two further details, mainly to clarify points in the article, which should have appeared in a subsequent issue.

The author, LA8AK has asked me to publish them now.

Referring to page 12, the 4th paragraph detailed some performance figures. It seems that these were made using 50-ohm test equipment and should therefore not be considered as a specification. To evaluate the filter at its design impedance of 75-ohms, the following circuit should be used:-



SHOWING THE USE OF MINIMUM LOSS PADS FOR CORRECT MATCHING.

LA8AK would have liked the specification: 11.3MHz bandwidth, 75-ohms, in the title. This information was however contained in paragraph 5.

Paragraph 1 states that the filter was used on the authors' satellite receiver whereas it was in fact on that of LA4WN.

The filter was designed by LA6AK.

I trust that this puts the record straight and that these notes will assist constructors.



CQ-TV EQUIPMENT REVIEWS

By John Wood G3YQC

The CQ Centre 24cm ATV converter

As Editor of this magazine the first thing that struck me upon unpacking the review converter was its name: "CQ-TV Microwave Television Receiving Converter". Although it is true that the manufacturers are The CQ Centre, it might have been courteous to let the BATC know that their magazine title was to be used on a commercial product. One could almost think it an attempt to capitalise on an existing well-known name; so let me make it quite clear: The BATC and CQ-TV magazine have no connection whatsoever with this product and it should therefore not be considered as having the backing of the BATC.



DESCRIPTION

The converter is housed in a die-cast box measuring 118 x 93 x 35mm. At first glance it looks quite smart but, on closer examination, the red paint with which it has been sprayed is not of the quality of similar products and had obviously been hand sprayed. The very large top label seemed a bit loud and looks to be printed on smooth paper and glued to the box. I guess it would soon show signs of wear. The rubber stick-on feet were crooked and the two coaxial connectors were a poor fit showing the PC board through the oversize holes.

A 2.5mm Jack socket is fitted to convey the 12v supply. A large, green LED with smart chrome surround indicates the 'power on' state.

The sheet accompanying the converter tells very little about it. A 'starter kit' is outlined thus:-

- "a) Antenna & feeder.
- b) Down Converter & power supply unit.
- c) Domestic UHF TV set.

The antenna may be a single multi-element Yagi on a fixed roof top mast. The 1300MHz signal from the local repeater is amplified and converted down to the users domestic TV (tuning between channel 34 & 44....)"

And the sheet ends:".....So just plug in, tune up, and away you go".

This all sounds quite straightforward until you realise that the majority of TV repeaters (and indeed simplex stations) transmit FM-TV. Presumably one is expected to 'slope-detect' the signals!

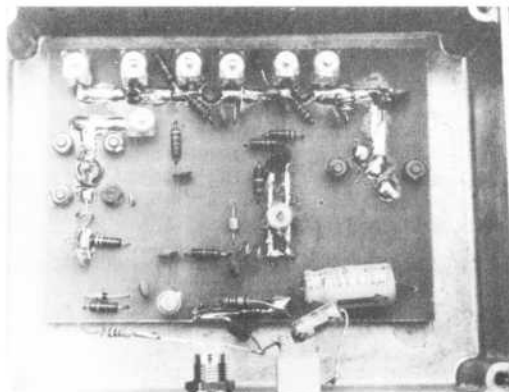
The only bit of information concerning the converter itself is that it works from 12 to 24v DC which may be unsmoothed. It does not define positive and negative although it is reverse polarity protected.

The choice of DC input connector is rather strange. On test it was found that the PSU can be momentarily shorted out by pushing the plug home!

General construction, although on a printed board, was poor. The 'classic' error has been made in that all the printed striplines have been liberally coated with soft solder (presumably in lieu of plating) in order to stop them tarnishing. The amount of solder used on each component joint was considerable.

Three 4BA half-nuts are placed between the board and die-cast box to act as spacers. The PC board is simply pulled tight against them by the coaxial connectors.

At this stage in a review I like to detail the unit specifications - none are given, and then describe the circuitry used - no circuit either. Looking at the board there seems to be a single pre-amplifier stage, an active mixer and a free-running oscillator together with a single transistor voltage regulator.



PERFORMANCE

The converter was assessed under laboratory conditions using a Hewlett Packard 8558B spectrum analyser, a Hewlett Packard 8614A UHF signal generator and a Kingshill 60V2 variable PSU.

A maximum overall gain of 9dB occurred at 1300MHz.

Bandwidth at the -3dB points was 36MHz (1278-1314MHz).

Local oscillator output (fundamental) at the IF output socket was -10dBm.

Local Oscillator output (2nd harmonic) at the IF output socket was -20dBm.

Local oscillator tuning range for a 3dB drop in IF output level (without re-peaking) was 691-745MHz.

Local oscillator stability is good when the unit is powered by more than 10v. Timed measurements were not made.

A re-alignment was carried out but performance altered little, however the overall gain increased to 10dB. The unit will tolerate an input signal of -8dBm (100mV) before gain compression occurs.

I liked....

The good quality die-cast box.

The BNC aerial socket.

The 'power on' indicator.

The stick-on feet.

I did not like....

The 'loud' panel label.

The DC input socket.

The poor fitting coaxial connectors.

The use of a Belling-Lee IF output socket.

The overall construction.

The PC board mounting arrangement.

The fact that all the transistors had their type numbers carefully removed.

The fact that the coax socket fixing nuts had red paint blobbed on them, presumably to detect whether the PC board had been removed.

The totally inadequate documentation.

CONCLUSION

For a commercial product this unit falls short of what is normally expected these days both in performance and construction. Although reasonably priced, the converter is inadequate for general 24cm ATV work unless a) at least one good quality, high gain pre-amplifier is also used or, b) reception of only very strong signals is anticipated.

The C.Q.Centre. 10 Merton Park Parade, Kingston Road, London SW19.

Solent Scientific 23cm FM-TV transmitter



The first thing to strike you upon unpacking this transmitter is its small size. Measuring a mere 105 x 50 x 29mm (including connectors) the unit can indeed be used as a truly handy portable.

DESCRIPTION

The transmitter is housed in a stout die-cast box and is fitted with good quality BNC coaxial connectors for both RF out and video in. Power is conveyed to the unit via a pair of 4mm Wanda sockets. There are no external controls.

Removing the top reveals a very nice, professional looking PC board. Two pre-set controls are available for frequency adjust and deviation. The unit uses a single BFR96 transistor and a 3-terminal voltage regulator ensuring good stability over a wide input voltage range.

My overall impression is of a well designed and engineered piece of equipment.

SPECIFICATION

RF output - 10mW
FM deviation - 3MHz
Power requirement - 12v DC (nominal)
Operating frequency - as required in the 23/24cm amateur band.

PERFORMANCE

I am bound to say that the two transmitters tested gave somewhat less than the specified output. This information, when conveyed to Solent Scientific, resulted in a third unit arriving within three days. It seems that owing to a spread of component types and tolerances the performance of some units had fallen off. A modification to increase the output has now been incorporated and the review model delivered over 20mW at 1280MHz, this only fell to 15mW at the HF end of its tuning range. I am assured that all units will now be supplied with the modification fitted.

Frequency stability is very good being only a few tens of KHz/minute after just 2-minutes warm up. The operating frequency is however effected by the output load used. This is a reflection on the units simple design - there being no output buffer stage. The frequency is originally set using a 50-ohm resistive load but, if (for instance) an aerial is used the frequency could be altered significantly. In practice, once the desired frequency is set with the load to be used fitted, no further problem is found.

Deviation as set by the manufacturer is about right for the normal PLL FM demodulator, however it is useful to be able to change it if required. Owing to the straightforward video input arrangement, deviation will be altered if levels other than the standard 1v p-p are applied.

I liked....

- The robust construction.
- The good quality coaxial connectors.
- The small size.
- The stability and reliability of operation.
- The controls for frequency and deviation.
- The excellent quality pictures produced.

I did not like....

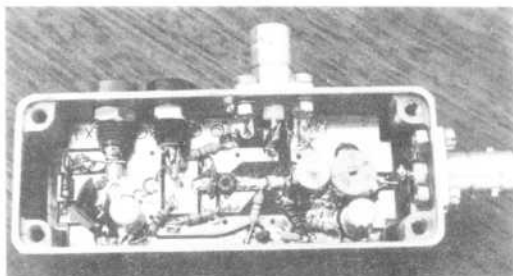
- The 'G8CMQ' callsign on the lid.
- The fact that no mounting stud or thread is provided.

CONCLUSION

The unit gives a good account of itself both as a transmitter and as a signal source for aligning receive equipment (via suitable UHF attenuators). It could possibly be used as a driver for a higher power amplifier.

As a ready-built unit it represents good value for money. In use it is reliable and produces consistently good quality signals without the need for any adjustments. It has quickly become an essential part of my station and can be highly recommended.

Price £29.95 +£1 postage.
Solent Scientific, 75 Chalk
Hill, Southampton, Hants.



This series of equipment reviews and user reports will include in future issues the Wood & Douglas 24cm ATV converter, the Solent Scientific 24cm ATV converter, the JVL Electronics 1.3GHz Quad-Loop Yagi and the use of the Piper Communications new 23cm converter UEK-3 in ATV service.

CQ-TV magazine will try to review as much new equipment as possible as it becomes available, if anyone could help with equipment assessment (especially aerials) I would be glad to hear from them. ED.

A MINI-AERIAL FOR 24

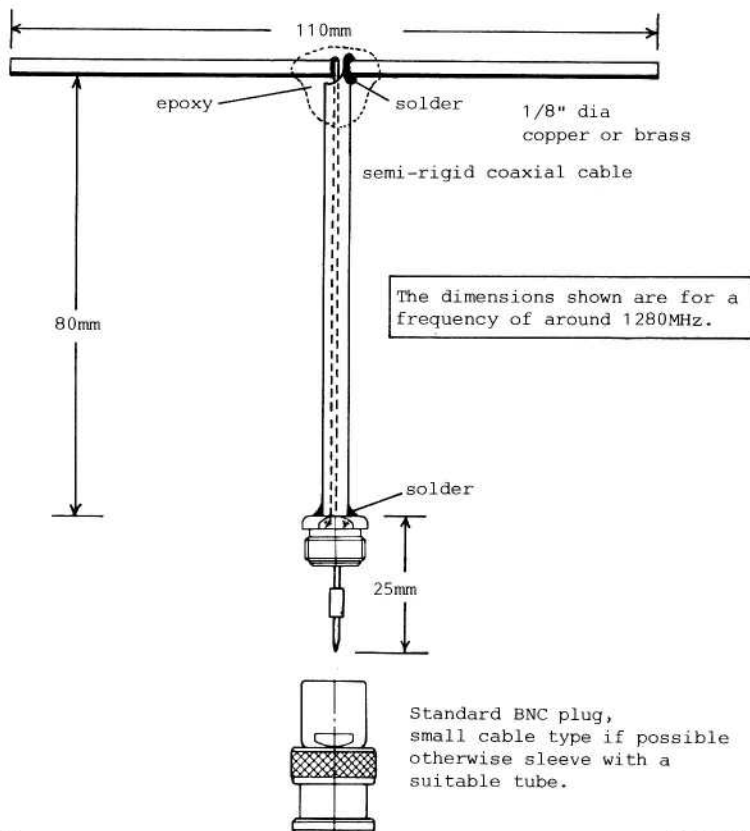
By John Wood G3YQC

The simple aerial described here is the result of a little research and experimentation. Purists will no doubt find fault with the design but it is simple and works well with my Solent Scientific 10mW 24cm transmitter for which it was designed.

VSWR and polar diagram tests have not been carried out although its directive properties are about what one would expect from a simple dipole.

For those not familiar with semi-rigid coax, the type I use is about 3.5mm in diameter, has a conventional looking inner but has a metal tube (usually silver plated) as the outer sheath. This cable is employed because of its rigidity. It can be found in many junk boxes and at rallies, often attached to pieces of microwave gear. It can also be purchased new from JVL Electronics, 26 Fernhurst Close, Hayling Island, Hampshire PO11 0DT.

Construction details may be learned from the diagram. When shaping the end of the coax outer, be sure that there is adequate clearance for the centre conductor element. A blob of epoxy adhesive will keep the elements in position.



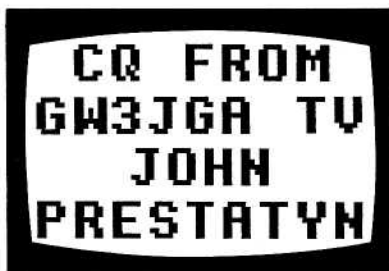
SOFTWARE NOTEBOOK

1 - "BIGTEXT" For BBC micro's

By Geoffrey Lawrence.

This is a useful large text display for TV amateurs who have a QTH of up to 9 letters. The text is typed-in in the normal way a line at a time, hitting RETURN generates the big letter version. Total screen area is 4 lines of 9 characters. The text is automatically centred and the text moves up when the screen is filled.

```
100 REM *** GEOFFREY LAWRENCE 1984 ***
110 MODE0:VDU23,42,255,255,255,255,255,255,255,255
120 PRINT CHR$11:INPUT A$:C$=""
130 IF LEN(A$)>9 OR LEN(A$)=0 GOTO 110
140 PRINT CHR$11;CHR$13;" "
150 FOR A=0 TO 6:FOR B=1 TO LEN(A$)
160 C=&BF00+(ASC(MID$(A$,B,1))*8)+A
170 C=?C:D=128:B$="":REPEAT
180 IF C>D-1 C=C-D:B$=B$+"*":GOTO 200
190 B$=B$+" "
200 D=D/2:UNTIL D=.5:C$=C$+B$:NEXT
210 D$="":FOR E=1 TO (80-(LEN(A$)*8))/2
220 D$=D$+" ":NEXT:D$=D$+C$:C$=D$
230 PRINT C$:C$="":NEXT:GOTO 120
```



If you have a favourite program, not just for the BBC but for any popular micro, which is related to ATV and which could be published in this new column, please send it to the Editor.

If possible please also include a print-out of the listing together with any relevant text or documentation.

Programs for the BBC may be either on disc (40 track SS SD) or tape. Others should be on tape.

INTERNATIONAL ATV SIMPLEX

1255.0MHZ

24CM TRADE NEWS

Andy Emmerson G8PTH

Buying new products on the strength of an advertisement alone can be a tricky business - fortunately some enlightened suppliers have sent new products for review. In addition I can report on some items which I have purchased.

In the first category come two receive converters. Both will need full testing, but initial results look favourable. From Wood & Douglas (Unit 13, Young's Industrial Estate, Aldermaston, Reading) comes their 1250DC50 tunable downconverter. It is intended to feed into a 50 MHz IF strip, such as their own VIDIF, and tunes the whole 24cm TV band. It uses a MGF 1100 GaAsFET, is very nicely made and costs £69.50 assembled. It is not available as a kit as the average amateur frankly does not have the necessary test gear. Sensitivity is as good as the other commercial product and it looks a winner: full report next time.

Somewhat cheaper is the block downconverter kit from Solent Scientific (75 Chalk Hill, Southampton): this includes PCB and all parts except case and connectors for £34.95. Noise figure is quoted as 3dB and a GaAsFET preamplifier is recommended. This one is easy to construct and works to specification; output is in Band 4 or 5.

I have now had time to evaluate the EME 23150 PA, sold in this country by Piper Communications (Dave Aram G8DVK, 4 Severn Road, Chilton, Didcot, OX11 0PW. 0235- 834328.) This is a twin tube device (2C39AB or similar) and is easily capable of 150 watts output or more on 1249 and 1255 MHz without modification. Having said that, I would not dream of running 150 watts for long; the beauty of the front panel bias control is that you can regulate the output power "from a whisper to a roar" (hands up who remembers those daft Headquarters & General ads!). Mind you, I need 100 watts to get a P5 signal into GB3TV 35 miles away. The bandwidth seems adequate for good audio (and colour if only the driver TX could handle it!)

I particularly like the quiet yet powerful blower and all told the EME23150 is a very nice piece of kit. No, it is not cheap but you can make other sacrifices if you are determined to have decent equipment. The standard of workmanship is excellent, and I think the only real complaint I would voice (which I have heard from others too) is that the cavity tuning is constantly drifting. So you need to keep an eye on the output power and be ready to twiddle a bit.

Piper Communications also sell a relay bypassed masthead GaAsFET preamplifier. This is also excellent, though a foolproof sequential switching system is required to avoid zapping the GaAsFET with RF. Excessive power is also fatal, but with normal handling this device is a great boon. Whether you buy this or a cheaper one from LMW Electronics (102 Stamford Street, Ratby, Leicester) a masthead preamp is indispensable on 24 cm.

CARNIVAL BROADCAST

By P.J.Hersey G4UDW



On July 7th - Carnival day - a special event station GB4HTV (Hospital TeleVision) was set up at Tunbridge Wells, in Kent. The original concept was simply to transmit the carnival procession via amateur TV to the local Homeopathic hospital, however, it snowballed and ended up on a scale rather like the broadcasting of a state occasion!

During the preceding weeks, a camera crew (myself and a local reporter) visited various events in the locality; Gala days, Fetes, Charity events and so on. These were all recorded and used as warm-up material prior to the carnival procession itself.

The few days prior to Carnival day saw assembled two JVC cameras, six video recorders of various types, a Commodore-64 computer, eight black and white and one colour preview monitors and a home-brew vision mixer.

Associated talk-back links were employed enabling the mixing desk operator to cue cameramen, VT operators, graphics men and everyone else involved with the production. A radio mic was used so that exhibitors and spectators could be interviewed live. The legality problem of these sound systems was solved by the provision of a 'Hospital Radio' link. As representatives of 'Hospital Radio' are always at the carnival providing live commentary to all the local hospitals, were were able to make use of their outside broadcast van equipped with 20-channel sound mixer.

A 48-element Multibeam was mounted 100ft above ground on top of the town hall, this was fed from a Fortop transmitter whilst at the receive end, a 20ft pole mounted on the hospital



roof supported another 48-element. The output of an up-converter was patched into the hospital distribution network along with the sound. This network supplied fourteen TV sets which, for this event, included a Mitsubishi projection unit kindly loaned to us by a local company: Howes of Southborough. Other companies who loaned equipment were: Radio Rentals and Tele-Centre of Tunbridge Wells.

The transmission lasted for 2.1/2 hours during which credits and call sign inserts were provided by the micro. The excellent test card (CQ-TV125) was also pressed into service via a BBC micro.

Many hours were spent organising the event and about 25 people were involved in production and presentation. The patients and staff enjoyed it so much that they can't wait till the next one!



The production crew in action

(Photo's from the 'Courier' newspaper - 13th July 1984)

Silent key

ALLAN (BUCK) BUCKNALL, G8BLZ

A well-known ATV'er, G8BLZ died on Thursday August 16th 1984 after a long illness. An avid home constructor, he was active on 2m, 70cm and 23cm as well as 70cm ATV.

Allan was one of the originators of the 24cm ATV FM repeater GB3UD and was looking forward to working through it. He will be gratefully missed by all members of the Stoke-on-Trent Amateur Radio Society where he was always willing to help the younger members of the club in any way he could.

The RATC wishes to extend its sincere condolences to members of Allan's family.

SOUND SENSE?

John Wood G3YQC

Page 52 of the last issue carried some comments and observations made by Andy Emmerson, drawn largely from his recent trip to the W.German ATV convention as a representative of the BATC.

One suggestion which seemed at first glance to be ill-advised does, I feel, deserve some deeper thought. I am referring of course to the question of whether or not we in the UK should consider adopting 5.5MHz as a standard for inter-carrier sound on FM-TV, rather than sticking with the traditional (but unique) 6MHz system.

As Andy says: "Audio subcarrier is 5.5MHz in all countries but our own". He quite rightly goes on to say that "there seems to be no good reason for sticking with 6MHz", but there are good reasons for changing to 5.5.

FACT: There are far more TV'ers than ever before on 24cm, therefore considerable numbers will be working into the Continent.

FACT: As equipment and techniques improve transmission distances are constantly being lengthened.

FACT: Virtually none of the continental amateurs feel it worth installing 6MHz sound just for the UK.

FACT: Being able to communicate in sound AND vision during openings could ease congestion on 2m for talkback.

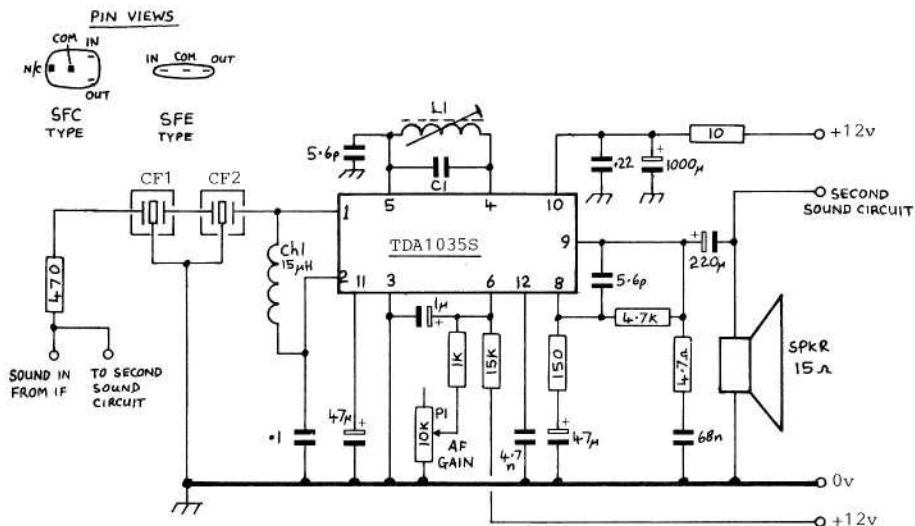
FACT: Because we (and the Continent) use FM-TV necessitating custom built receivers, we are no longer restricted by the original circuitry in domestic TV sets.

FACT: The use of 5.5MHz sound would help to reduce channel bandwidth.

Surely it makes sense to at least consider changing to 5.5. Having personally worked into the continent on 24 on a number of occasions, I have already come against this non-compatibility problem, and I live in the midlands! As a consequence I have modified my receiver so that both 6 and 5.5MHz sound is available.

Since I did not wish to litter the receiver with switches or relays I tried, as an experiment, wiring two identical (except for frequency) sound systems in parallel. Switching between the two being accomplished simply by applying 12 volts to the appropriate board. Although I appreciate that, strictly speaking, impedance requirements have not been satisfied, for practical purposes, the system works well and there is no discernable degradation in performance compared to a 'one circuit' system.

The circuit I use is illustrated in Fig.1 and is that used in many modern TV sets. Two may be built on a single printed board but could equally well be on stripboard (Vero). Obviously, for those who prefer, the input and speaker connections may be controlled by a double-pole changeover switch or by two relays. If this is done try not to make the input leads too long.



There are two common types of ceramic filter available so, before making a PC board, check which ones you are going to use. The quadrature inductor L1 may be any sound coil from a TV chassis but I use the Toko type MKANSK1731 available from 'Circuit' (Ambit). In this case the value of C1 should be 560pF for 6MHz and 680pF for 5.5MHz. The volume control P1 should be a dual gang linear pot, obviously using one gang for each circuit, in this way balance between the two systems should be identical. Ch1 is a fixed inductor and the 4.7-ohm resistor may be made-up by using two 10-ohms in parallel. On some IF/demodulator boards (such as the CQ-TV design - issue 122) there is a series resistor and DC blocking capacitor provided on the board, in this case replace the resistor with a wire link leaving the capacitor as it is.



WINTER CONTESTS

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FEB 2 & 10TH

⊕ DON'T FORGET ⊕

The "yet another....."

GREY-SCALE GENERATOR

By B.J.Dandy G8MGH

The various designs of grey-scale generator which have appeared in CQ-TV in the past suffer from two minor defects, namely, that the first bar is too wide, and the staircase is non-linear, owing to poor summing. Although adequate on the TV screen, these defects are rather annoying when using a 'scope for testing.

The present design sets out to overcome both problems as simply as possible.

FIRST BAR

A monostable driven from mixed blanking generates a short line blanking period, adjustable in duration, which allows the oscillator to start before the end of line blanking proper.

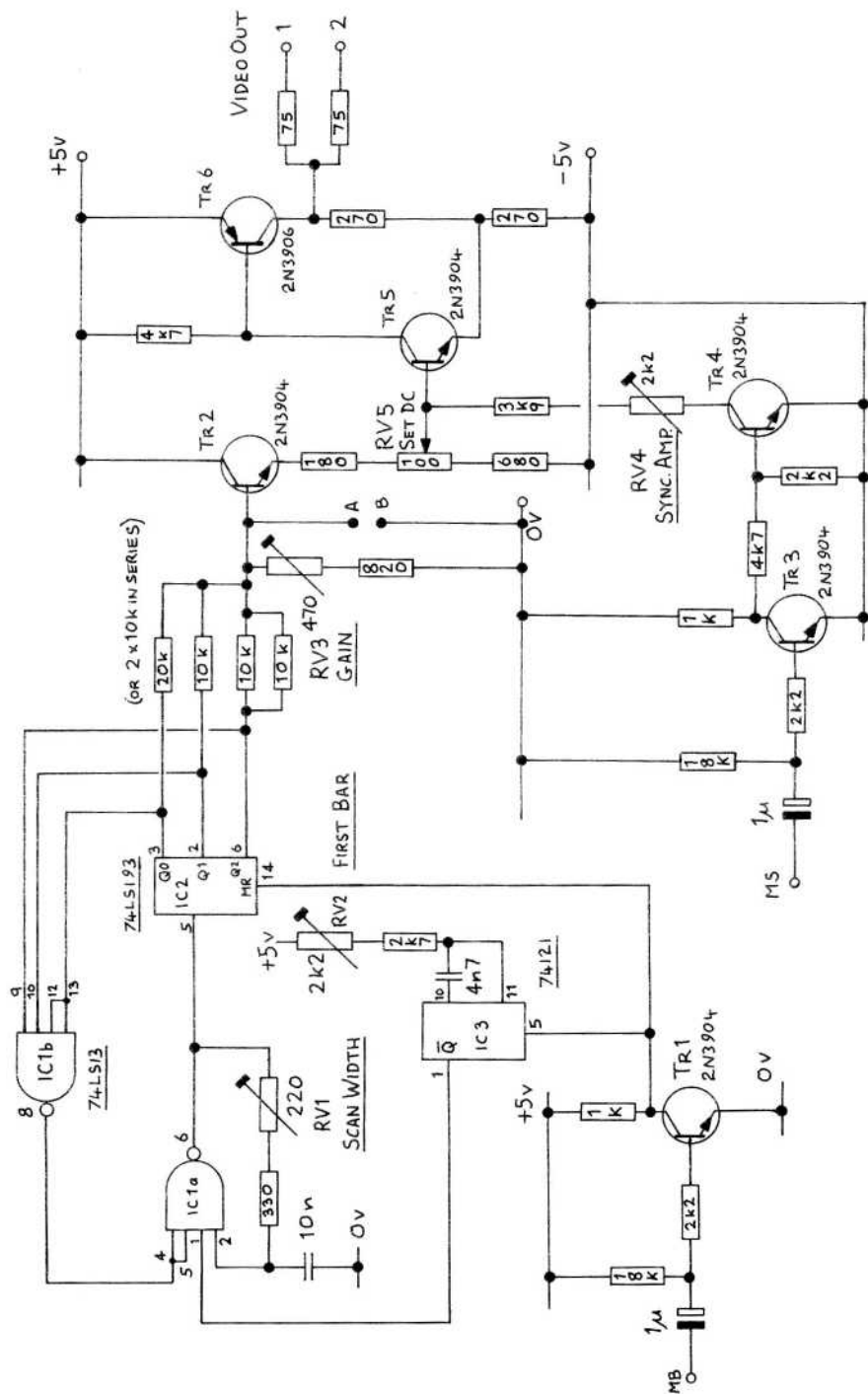
STAIRCASE LINEARITY

The summing point of the resistor network should strictly speaking be a virtual earth, however, in practice about 1k is acceptable. The result of this is that the waveform amplitude is too low, so the output stage has to include some gain - 2 times is sufficient. The emitter follower output stage not only buffers the output, but also serves to set the DC level to zero.

SETTING UP

1. Disconnect sync input and short A-B
2. Set DC level at video outputs to 0v with RV5
3. Remove short from A-B, terminate both video outputs in 75-ohms and confirm that the staircase is correct. Set the output level to 0.7v with RV3.
4. Re-connect sync input and set sync level to 0.3v using RV4.
5. Adjust 'scan width' (RV1) and 'first bar' (RV2) to give a correctly proportioned display.

For anyone who may be interested, a printed circuit board layout is available from the author at 21 Summerhill Avenue, Kidderminster, Worcestershire DY11 6BY.



TV FOR HAREFIELD

By Simon Gough.

I have been a member of the BATC for over four years and, although a non-transmitting amateur, I have 'dabbled' for the past ten years, starting when I was at school.

This is the first time that I have attempted to contribute to CQ-TV and I thought that readers may be interested in my activities.

Two years ago I took the decision to go colour and, through the help of many people I acquired a couple of Marconi Mk VII four-tube broadcast cameras. Later on I added to these but found it very difficult to operate them easily because of their size and weight.

Since all this equipment was being used at Harefield hospital where I help run the hospital radio, we put our heads together and decided that what we needed was an Outside Broadcast van.

After much hunting I finally contacted the Central Electricity Generating Board who informed me that they were disposing of their OB van. As luck would have it, it was built and fitted by Marconi and was complete with four Mk VII camera channels.

After many phone calls and letters, hospital radio was informed that the CEEGB were to donate the unit to us and, in mid-June a group travelled to Birmingham to collect the unit. It is now in the grounds of the hospital and we are currently converting an old pre-fab building into a drive-in studio.

We did our first programme with the van on Sunday September 16th and covered the annual Fun Run in aid of the heart transplant trust.

Many weeks of preparation went into the show and at the end of the day we had almost three hours of recorded material ready for editing. In addition to our own four cameras we had enormous help from the Home Counties ATV Group who provided us with a remote camera and many hours of manpower before the event trying, unsuccessfully, to repair our genlock SPG. My thanks go to them and especially to Paul Andrews G6MMJ for co-ordinating his group.

It is hoped to have some photo's and other details for the next CQ-TV but meanwhile, if anyone would like to know more about us and perhaps come and see the equipment they may phone me on 01 421 0413 anytime.



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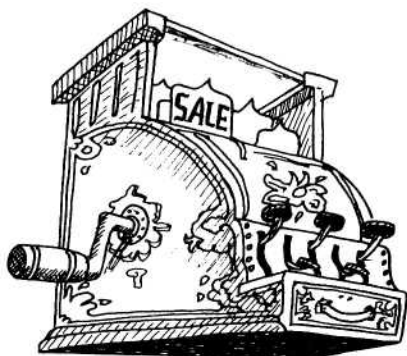
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FOR SALE

TWO HITACHI colour cameras type GP5E. One VGC other for parts. Canon zoom and fixed 35mm lenses, 240v PSU. £180. o.n.o.
 A.J.Downs GM6NE1, Stable Cottage, Ironmills, Dalkeith., Midlothian EH22 1JP.
 Tel: 031 660 4180 (days).

DESIGN LITERATURE and some parts for SSTV flying spot scanner (the simple way to transmit SSTV). 3FP7 L/P tube and base, 931A photomultiplier and base with 600v PSU, some PCB's ready for assembly. £15 the lot plus postage.
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 M.C.Walker G41JI, 96 Sunnybank, Hull HU3 1LF, N.Humberside.

BATC COLOUR test card and PAL coder. 4 boards including PROM. Part built (not bodged!). Lack of time forces sale. £19 the lot.
 T.Blinco G8KNJ, 4 Dunlin Close, Redhill, Surrey. Tel: 0737 72202.

ONE EACH of the following camera cases which are complete with yokes, 'C' lens mounts and vidicon bases: PYE Industrial including motorised focus plus lens change £4. MARCONI 4339A plus IKEGAMI CTC 5000 including manual focus screw assy £3 each. PYE TVC/1A Lynx £5. Rank Taylor Hobson 17-85mm f2 'C' mount zoom lens £25. S4077C 1" colour striped vidicon, as new £30 or swap for good 1" Plumbicon/Saticon or WHY. All items plus postage at cost.
 Trevor Lumb, 22 Briarwood Avenue, Bury St. Edmunds, Suffolk IP33 3QF. Tel: 0284 5318.

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Mike Cox GBHUA, 10 Moorfield Avenue, Scholes, Cleckheaton, West Yorks BD19 6PG. Tel: 0274 875066 (after 6pm).

MARCONI V322 series cameras. Two with viewfinders, two without. All documentation but no lenses. These are good industrial quality 1" vidicon b/w cameras and were working when last used. First come first served at £25 apiece. Phone Mr. Lane on Chelmsford 0245 - 87073.

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WANTED VA214 BATTERY PACK for Ferguson 3V24 (JVC HR2200) portable video recorder and 3V26 charger and connectors.
No phone, please write by middle of month. George Woods, 5 Mere Green, Walton, Liverpool L4 5XL

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R.G.D. Band-1 only TV, B1700, 12" round tube, aprox 1949-50 £5.00. FERRANTI T1001 14" TV. Brand new with spares in working order. 1957-8. £5.00. PROJECTION TV tube, MW6-2, new in box, offers. MURPHY radio A122C, mid '40s £5.00.
D.Longstaff G4WCD, 100 Hawthorn Avenue, Anlaby Road, Hull HU3 5QR, Humberside. Tel: 0482 509898 (evenings).

EXCHANGE & WANTED

CQ-TV issues 76 and 78 (out of print) needed. Specimens for copying and return will do. TO SPARE, issues 67 and 68.

Doug Pitt. 1 Burnwood Drive, Wollaton, Nottingham. Tel: Nottingham 282896

LARGE QUANTITY of new radiotelephone and misc. valves, eg: 13E1/CV6045, A2134/CV2179, 6J5G/L63 and CRO tube type 89 (Cossor). Would exchange for any of the following:- Stereo open-reel tape recorder, M21-13W CRT, test card C or D slides or monoscope tubes, N1512 VCR or CVBS board, Leak valve Hi-Fi or W.H.Y? (Please phone for full valve list)

Dave Hazell, 36 Park Road, Northleigh, Witney, Oxon OX8 6RX. Tel: 0993 882238

SSTV spares which were kept for 'FP7 type monitors: 7BP7 7" CRT with scan coils, focus magnet, EHT transformer, mains transformers for Spacemark monitor plus lots of other gear. Would rather swap for something interesting.

John Brown G3LPB, 45 Marlborough Avenue, Falmouth, Cornwall TR11 4HS.

ACCOMODATION required in Hatfield area for student - G4LNT age-18 at Polytechnic. Weekdays only with evening meal. Own car.

Ken Thompson G4PAD, 113 Gordon Road, Stanford-Le-Hope, Essex Tel: 0375 671238

WANTED: Any information on an Epsilon 12V nuvistor/transistor 1" vidicon camera.

Would anyone like to sell me one of those cylindrical EMI "industrial" cameras (1" tube, nuvistor head-amp, separate CCU) for my relics collection?! I am still looking for monoscope tubes (except Test Card C) to buy or swap. Thanks to all the kind people who offered to copy my Philips tapes to VHS - it's done now.

Andy Emmerson G8PTH, Northampton 0604 - 844130.

CRT type 1374Q or D13-51GH wanted. Also base, Mu-metal screen and trace rotate coil for same.

Peter Delaney G8KZG. 6 East View Close, Wargrave, Berkshire, RG10 8BJ. Tel: Wargrave 3121.

EXCHANGE (1) Rigonda 'Fiesta' portable TV for 9" b/w monitor. (2) TR10 TR2200G crystals: S16, 19, 20, 21, 22, 23, R2, R3. Charger, carrying case,, 'rubber duck' aerial, manual PLUS Pye Westminster W15 FM low-band plus CCT for FM mobile 2m or 70cm?

WANTED (1) CIRCUIT diagram for Peto Scott monitor type TB1204/A, will pay expenses - can copy and return. (2) CRT type AW21-11 for Beulah monitor. (3) CIRCUIT or info on Ferrograph tape recorder 5835-99-943-8234 (ministry number!).

Ray Hill G6TSL, 7 Willowbrook, Greytree, Ross-on-Wye, Herefordshire HR9 7JS

TO BUY OR BORROW - manual or circuit for Peto Scott monitor T/B1204 Mk2. Any spares and tubes would also be useful. All expenses paid. CAN ANYONE HELP with the optical system for a Marconi Mk7 colour camera and, if possible, the whereabouts of some spares. All letters answered.

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25-el Quad Loop (available soon)	C	23.0	18'	£45.00	
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